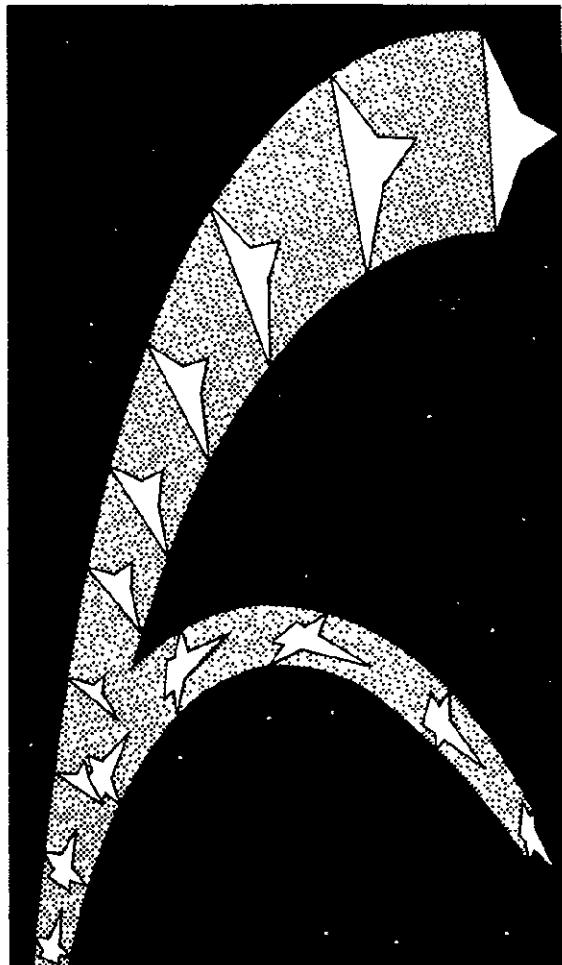


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CR-103200
DMS-DR-1055



-SPACE SHUTTLE-

DETERMINATION OF STATIC
LONGITUDINAL AND LATERAL
DIRECTIONAL STABILITY
CHARACTERISTICS OF THE
NR/GD DELTA WING
ORBITER/SATURN V S-IC BOOSTER

NASA
MARSHALL SPACE FLIGHT CENTER
WIND TUNNEL TEST RESULTS
DATA REPORT

FEBRUARY 1971

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SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
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SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: NR/GD Delta Wing Orbiter/Saturn V S-IC Booster

TEST PURPOSE: To determine Static Longitudinal and Lateral Directional
Stability Characteristics of the NR/GD Delta Wing Orbiter/
Saturn V S-IC Booster

TEST FACILITY: MSFC 14 x 14 Inch Trisonic Wind Tunnel

TESTING AGENCY: Marshall Space Flight Center

TEST NO. & DATE: MSFC TWT 476, December, 1970

TEST CONDUCTOR(S): Craig H. Muhlhauser/MSFC

SADSAC COORDINATOR: J. Weaver

DATA MANAGEMENT SERVICES

LIAISON: John E. Vaughan DATA OPERATIONS: B. J. Friskan

RELEASE APPROVAL: N. D. Kemp
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Aero Thermo Data Group

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ABSTRACT

Experimental aerodynamic investigations have been made in the Marshall Space Flight Center 14 x 14 inch Trisonic Wind Tunnel on a North American Rockwell Corporation delta wing orbiter mated to a Saturn V S-IC booster for the primary purpose of determining the optimum incidence angle of the orbiter relative to the booster. Tests were conducted during December 1970 and covered a Mach number range from 0.60 to 1.96 over an angle of attack schedule from -12° to 12° at zero degrees sideslip and a sideslip schedule from -1.5° to 1.6° at zero degrees angle of attack. Orbiter incidence angles tested were -2°, +1°, and +4°.

TEST CONDITIONS

Table I lists the conditions that prevailed during collection of the data and gives the balance load limits. Data were taken over an angle of attack range from -12° to 12° at a sideslip angle of 0° and over a sideslip angle range from -1.5° to 16° at an angle of attack of 0° . The angles of attack and sideslip herein have been corrected to include the sting deflections due to loads.

Figures 1 and 2 show typical installations of the models in the MSFC 14 x 14 inch wind tunnel.

Booster base pressure and balance cavity pressure were measured at locations shown in Figure 3. A turbulent boundary layer was assured over the model by using #120 grit applied to surfaces as shown in Figure 4.

TABLE I

TEST CONDITIONS
TEST TWT 476

BALANCE UTILIZED: MSFC Balance #200

ACCURACY:

COEFFICIENT TOLERANCE:

NF	175 lbs
SF	150 lbs
AF	100 lbs
PM	185 in-lbs
YM	160 in-lbs
RM	50 in-lbs

100

—
—
—
—
—
—

COMMENTS:

DATA REDUCTION

Six component aerodynamic force and moment data were recorded using an internal strain gage balance. Base pressure and balance cavity pressures were also recorded and were utilized to correct the axial force measured reading to a condition corresponding to freestream pressure acting at the base and cavity regions. The pressure data have been plotted in coefficient form herein for perusal.

The force and moment data were reduced to coefficient form using the following reference values:

$$S_{REF} = S\text{-IC booster body maximum X-sectional area} = 1.396 \text{ in}^2$$

$$l_{REF} = b_{ref} = S\text{-IC base diameter} = 1.333 \text{ in}$$

Additionally the moment data have been referenced about a point 5.264 inches forward of booster model station 0.0 on the longitudinal centerline (see Figure 9).

CONFIGURATIONS INVESTIGATED

CONFIGURATION NOMENCLATURE

B ₅	NAR delta wing orbiter body (9992-134B) including a canopy on the upper surface aft of nose (see Figure 5)
W ₁₄	NAR delta wing, complete with no clipped tip (see Figure 6)
E ₃	Elevon used with W ₁₄ (see Figure 7)
V ₁₇	Centerline vertical stabilizer with 5° (half angle) wedge trailing edge (see Figure 8)
B	S-IC Body; drawing No. GDC 383-4 (see Figure 9)
F _{X(1,2)}	S-IC 900 ft ² fins each mounted at 30° or 45° angle, drawing No. GDC 383-12 (see Figure 10)
F ₃	S-IC 600 ft ² fins each mounted at selected angle (sawed off tips)
S	Strongback

CONFIGURATION COMBINATIONS TESTED

BF_XS + B₅W₁₄E₃V₁₇; (X = 1, 2)

BS + B₅W₁₄E₃V₁₇

The immediately following pages list pertinent dimensional data for each of the above components.

MODEL COMPONENT: BODY - B5

GENERAL DESCRIPTION: 9992-134 B Body. Delta wing orbiter including a canopy on the upper surface aft of the nose. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length, In.	<u>2120.00</u>	<u>7.420</u>
Max. Width, In.	<u>462.86</u>	<u>1.620</u>
Max. Depth, In.	<u>274.29</u>	<u>0.960</u>
Fineness Ratio	<u>5.906</u>	<u>5.906</u>
Area		
Max. Cross-Sectional (ft^2)	<u>702.75</u>	<u>0.0086</u>
Planform	<u>-</u>	<u>-</u>
Wetted	<u>-</u>	<u>-</u>
Base	<u>-</u>	<u>-</u>

MODEL COMPONENT: Wing - W14

GENERAL DESCRIPTION: 9992-134B delta wing which is the same as wing-W13 except modified to a complete delta (no clipped tip). The total and exposed data do not include the leading cuff data which is listed below. (.0035 scale)

DRAWING NUMBER:

DIMENSIONS:

FULL-SCALE

MODEL SCALE

TOTAL DATA

Area

Planform, ft²

6084.00

0.074529

Wetted

Span (equivalent), in.

1420.44

4.972

Aspect Ratio

2.287

2.287

Rate of Taper

1.723

1.723

Taper Ratio

0.000

0.000

Diehedral Angle, degrees

7.000

7.000

Incidence Angle, degrees

0.000

0.000

Aerodynamic Twist, degrees about T.E.

@ Wing Sta. 241.80 in.

0.000

0.000

@ Wing Sta. 546.07 in.

-5.000

-5.000

Sweep Back Angles, degrees

Leading Edge

59.870

59.870

Trailing Edge

0.000

0.000

0.25 Element Line

52.266

52.266

Chords:

Root (Wing Sta. 0.0), in.

1232.91

4.315

Tip, (equivalent) (Wing Sta. 715.55 in)

0.000

0.000

MAC (Wing Sta. 238.52 in.)

821.94

2.877

Fus. Sta. of .25 MAC, in.

1503.54

5.262

W.P. of .25 MAC, in.

46.74

0.164

B.L. of .25 MAC, in.

236.74

0.829

Airfoil Section

Wing Sta. 241.80 in.

NACA 0009-64

NACA 0009-64

Wing Sta. 546.07 in.

NACA 0012-64

NACA 0012-64

EXPOSED DATA

Area, ft²

2733.29

0.03348

Span, (equivalent)

948.77

3.321

Aspect Ratio

2.287

2.287

Taper Ratio

0.000

0.000

Chords

Root (equiv.) (Wing Sta. 237.61 in.)

823.51

2.882

Tip (equiv.) (Wing Sta. 715.55 in.)

0.000

0.000

MAC (Wing Sta. 396.92 in)

549.01

1.922

Fus. Sta. of .25 MAC, in.

1708.24

5.979

W.P. of .25 MAC, in.

66.05

0.231

B.L. of .25 MAC, in.

393.96

1.379

MODEL COMPONENT: Elevon - E3

GENERAL DESCRIPTION: Elevon used with the 9992-134B complete delta (no clipped tip) wing (wing-W14) (.0035 scale)

DRAWING NUMBER:

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area, ft ²	<u>464.60</u>	<u>0.00569</u>
Span (equivalent), in.	<u>334.68</u>	<u>1.171</u>
Inb'd equivalent chord(Wing Sta.211.39 in)	<u>253.79</u>	<u>0.888</u>
Outb'd equivalent chord(Wing Sta.546.07in)	<u>146.01</u>	<u>0.511</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>0.292</u>	<u>0.292</u>
At Outb'd equiv. chord	<u>0.500</u>	<u>0.500</u>
Sweep Back Angles, degrees		
Leading Edge (Hingeline)	<u>17.851</u>	<u>17.851</u>
Tailing Edge	<u>0.000</u>	<u>0.000</u>
Hingeline	<u>17.851</u>	<u>17.851</u>
Area Moment (Normal to hinge line), ft ³	<u>8025.69</u>	<u>0.00034</u>

MODEL COMPONENT: Vertical Stabilizer - V₁₇

GENERAL DESCRIPTION: Centerline vertical stabilizer with the 5° (half angle) wedge trailing edge. (.0035 scale)

DRAWING NUMBER: S-867-47, -50

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
<u>TOTAL DATA</u>		
Area, ft ²		
Planform	663.63	0.00815
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Diehedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle, degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root, (W.P. 274.29 in.)	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in.)	122.65	0.429
MAC(W.P. 428.19 in.)	279.74	0.979
Fus. Sta. of .25 MAC, in.	2032.98	7.115
W.P. of .25 MAC, in.	428.19	1.499
B.L. of .25 MAC, in.	0.0	0.0
Airfoil Section, wedge shape with		
L.E.R. and flat T.E.	6.29	0.022
Tip L.E. Radius, in. (1.6% chord)		
<u>EXPOSED DATA</u>		

EXPOSED DATA

Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: BODY - B

GENERAL DESCRIPTION: Saturn V/S-IC Booster (0.003366 Scale)

DRAWING NUMBER: GDC 383-4

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length , ft.	<u>130.33</u>	<u>5.101 in. (1)</u>
Max. Width , ft.	<u>46.84</u>	<u>5.264 in. (2)</u>
Max. Depth , ft.	<u>46.84</u>	<u>1.893 in.</u>
Fineness Ratio	<u>0.276</u>	<u>0.276</u>
Body Dia.	<u>33 ft.</u>	<u>1.333 in.</u>
Area		
Max. Cross-Sectional Body		<u>1.396 in.²</u>
Planform		
Wetted		
Base Total		<u>2.170 in.²</u>
Cavity		<u>1.131 in.²</u>
Solid Base		<u>1.039 in.²</u>

(1) To end of engine fairing.

(2) To Station 0.0

MODEL COMPONENT: Fin - F_xGENERAL DESCRIPTION: 900 ft² fins mounted at $\left(\frac{3c}{4S} \right)$ degree angle

DRAWING NUMBER:

DIMENSIONS: (Each Fin)FULL-SCALEMODEL SCALETOTAL DATA

Area		
Planform, ft ²	900	1.541 in. ²
Wetted		1.381 in. ²
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees		
Incidence Angle, degrees		
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	30°	30°
Trailing Edge	0°	0°
0.25 Element Line		
Chords:		
Root (Wing Sta. 0.0)		
Tip, (equivalent)		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section		
Root		
Tip		

EXPOSED DATA

Area	154230 in. ²	1.541 in. ²
Span, (equivalent)	485 in.	1.237 in.
Aspect Ratio	1.525 in.	1.237 in.
Taper Ratio		.474
Chords		
Root	450 in.	1.515 in.
Tip	186 in.	.717 in.
MAC		1.242 in.
Fus. Sta. of .25 MAC		.895 in.
W.P. of .25 MAC		1.276 in.
B.L. of .25 MAC		1.275 in.

TEST MSFC TWT476 DATA SET COLLATION SHEET

PRETEST
 POSTTEST

2

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

COEFFICIENTS:

α or β
SCHEDULES

$$\begin{aligned} dA &= -12, -10, -8 \quad 0, -2, 0, 2 \quad \dots \\ dB &= -1.5, 1, 0, -1, 0, 3, 12, \dots \end{aligned}$$

TEST MSFC 476 DATA SET DESCRIPTOR SHEET

8

SREF(1)	11	SREF(2)	21	LREF(1)	31	LREF(2)	41	BREF(1)	51	BREF(2)	61	XMRP(1)	71	XMRP(2)
1.396		150.1N.		1.333		1INCHES		1.333		1INCHES		15.264		1INCHES
0.0		1INCHES		0.0		1INCHES		0.003366		1				
YMRP(1)		YMRP(2)		ZMRP(1)		ZMRP(2)		SCALE(1)		SCALE(2)		FILREF		

TEST FACILITY DESCRIPTION

The Marshall Space Flight Center 14" x 14" Trisonic Wind Tunnel is an intermittent blowdown tunnel which operates by high pressure air flowing from storage to either vacuum or atmospheric conditions. A Mach number range from .2 to 5.85 is covered by utilizing two interchangeable test sections. The transonic section permits testing at Mach 0.20 through 2.50, and the supersonic section permits testing at Mach 2.74 through 5.85. Mach numbers between .2 and .9 are obtained by using a controllable diffuser. The range from .95 to 1.3 is achieved through the use of plenum suction and perforated walls. Mach numbers of 1.44, 1.93 and 2.50 are produced by interchangeable sets of fixed contour nozzle blocks. Above Mach 2.50 a set of fixed contour nozzle blocks are tilted and translated automatically to produce any desired Mach number in .25 increments.

Air is supplied to a 6000 cubic foot storage tank at approximately -40°F dew point and 500 psi. The compressor is a three-stage reciprocating unit driven by a 1500 hp motor.

The tunnel flow is established and controlled with a servo actuated gate valve. The controlled air flows through the valve diffuser into the stilling chamber and heat exchanger where the air temperature can be controlled from ambient to approximately 180°F. The air then passes through the test section which contains the nozzle blocks and test region.

Downstream of the test section is a hydraulically controlled pitch sector that provides a total angle of attack range of 20° ($\pm 10^{\circ}$). Sting offsets are available for obtaining various maximum angles of attack up to 25° .

The diffuser section has movable floor and ceiling panels which are the primary means of controlling the subsonic Mach numbers and permit more efficient running supersonically. The sector assembly and supersonic diffuser telescope into the subsonic diffuser to allow easy access to the model and test section.

Tunnel flow is exhausted through an acoustically damped tower to atmosphere or into the vacuum field of 42,000 cubic feet. The vacuum tanks are evacuated by vacuum pumps driven by a total of 500 hp.

Data is recorded by a solid state digital data acquisition system. The digital data is transferred to punched cards during the run to be reduced later by a computer to proper coefficient form.

The tunnel components and performance are discussed in more detail in NASA TM X -53185, dated December 22, 1964, and NASA TM X-53113, dated August 30, 1964.

NOMENCLATURE

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
A_b		base area; m^2 , ft^2 , in^2
a		speed of sound; m/sec , ft/sec
AR	ASPECT	aspect ratio, b^2/S
b	REFB	wing span or reference span; m , ft , in
c		wing chord; m , ft , in
\bar{c}		wing mean aerodynamic chord or reference chord; m , ft , in (see ℓ_{ref} or refl)
c.g.		center of gravity
C.P.		center of pressure
C_A	CA	axial force coefficient, F_A/qS_{ref}
C_{A_b}	CAB	base axial force coefficient, $[(p_\infty - p_b)/q] (A_b/S_{\text{ref}})$
C_{A_f}	CAF	forebody axial force coefficient, $C_A - C_{A_b}$
C_D	CDTTL	drag force coefficient in the wind axis system, $F_D/q S_{\text{ref}}$

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
C_D'	CD	drag force coefficient in the stability axis system, $F_D'/q S_{ref}$
C_L	CL	lift force coefficient (stability or wind axis) $F_L/q S_{ref}$
C_ℓ	CBL	rolling moment coefficient in body axis system, $M_x/q S_{ref} b$
$C_{\ell,s}$	CSL	rolling moment coefficient in the stability axis system, $M_{x,s}/q S_{ref} b$
$C_{\ell,w}$	CWL	rolling moment coefficient in the wind axis system, $M_{x,w}/q S_{ref} b$
C_m	CLM	pitching moment coefficient in the body axis system, $M_y/q S_{ref} \ell_{ref}$
$C_{m,s}$	CLM	pitching moment coefficient in the stability axis system, $C_{m,s} = C_m$
$C_{m,w}$	CPM	pitching moment coefficient in the wind axis system, $M_{y,w}/q S_{ref} \ell_{ref}$
C_N	CN	normal force coefficient in the body axis system, $F_N/q S_{ref}$

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
C_n	CYN	yawing moment coefficient in the body axis system, $M_z/q S_{ref} b$
$C_{n,s}$	CLN	yawing moment coefficient in the stability axis system, $C_{n,s} = C_n$
$C_{n,w}$	CLN	yawing moment coefficient in the wind axis system, $M_{z,w}/q S_{ref} b$
C_p	CP	pressure coefficient, $(p-p_\infty)/q$
C_y	CY	side force coefficient (body or stability axis system), $F_y/q S_{ref}$
C_c	CC	side force coefficient (wind axis system), $F_y/q S_{ref}$
F_A		axial force; N, lb
F_D		drag force in wind axis system; N, lb
F'_D		drag force in the stability axis system; N, lb
F_L		lift force (stability or wind axis system); N, lb
F_N		normal force; N, lb

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
F_Y		side force; N, lb
	N/A	normal to axial force ratio
ℓ_{ref}	REFL	reference length; m, ft, in (see c)
L/D	L/D	lift-to-drag ratio, C_L/C_D (stability axis system)
L/D	CL/CD	lift-to-drag ratio, C_L/C_D (wind axis system)
M	MACH	Mach number
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on x-axis
	YMRP	abbreviation for moment reference point on y-axis
	ZMRP	abbreviation for moment reference point on z-axis
M_x		rolling moment in the body axis system; N-m, ft-lb
$M_{x,s}$		rolling moment in the stability axis system; N-m, ft-lb

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
$M_{x,w}$		rolling moment in the wind axis system; N-m, ft-lb
M_y		pitching moment in the body (or stability) axis system; N-m, ft-lb
$M_{y,w}$		pitching moment in the wind axis system; N-m, ft-lb
M_z		yawing moment in the body axis system; N-m, ft-lb
$M_{z,w}$		yawing moment in the wind axis system; N-m, ft-lb
p		static pressure; N/m ² ; psi
P		total pressure; N/m ² ; psi
q	Q(PSD) Q(PSF)	dynamic pressure; N/m ² , psi, psf
RN/L	RN/L	Reynold's number per unit length; million/ft.
S		wing area; m ² , ft ²
S_{ref}	REFS	reference area; m ² , ft ²
T		temperature; °K, °C, °R, °F
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
i_T		tail incidence positive when trailing edge down, deg
\bar{V}		velocity of vehicle relative to surrounding atmosphere; m/sec, ft/sec
α	ALPHA	angle of attack, angle between the projection of the wind X_w -axis on the body X, Z-plane and the body X-axis; deg
β	BETA	sideslip angle, angle between the wind X_w -axis and the projection of this axis on the body X-Z-plane; deg
γ		ratio of specific heats
Γ	DIHDRLL	wing dihedral angle; deg
δ		control surface deflection angle; deg positive deflections are:
	AIRLON	aileron - left aileron trailing edge down
	ELEVTR	elevator - trailing edge down
	RUDDER	rudder - trailing edge to the left
	FLAP	flap - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
ρ		air density; K_g/m^3 , slugs/ft ³

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
θ		pitch angle, angle of rotation about the body Y-axis, positive when the positive Z-axis is rotated toward the positive X-axis; deg
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; deg
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; deg

NOMENCLATURE (continued)

<u>SUBSCRIPTS</u>	<u>DEFINITION</u>
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	stability axis system
t	tail, or total conditions
w	wind axis system
ref	reference conditions
∞	freestream condition

ADDITIONS TO STANDARD NOMENCLATURE

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
i_o	ORBINC	orbiter incidence angle, degrees (positive, nose up)

FIGURES AND PHOTOGRAPHS

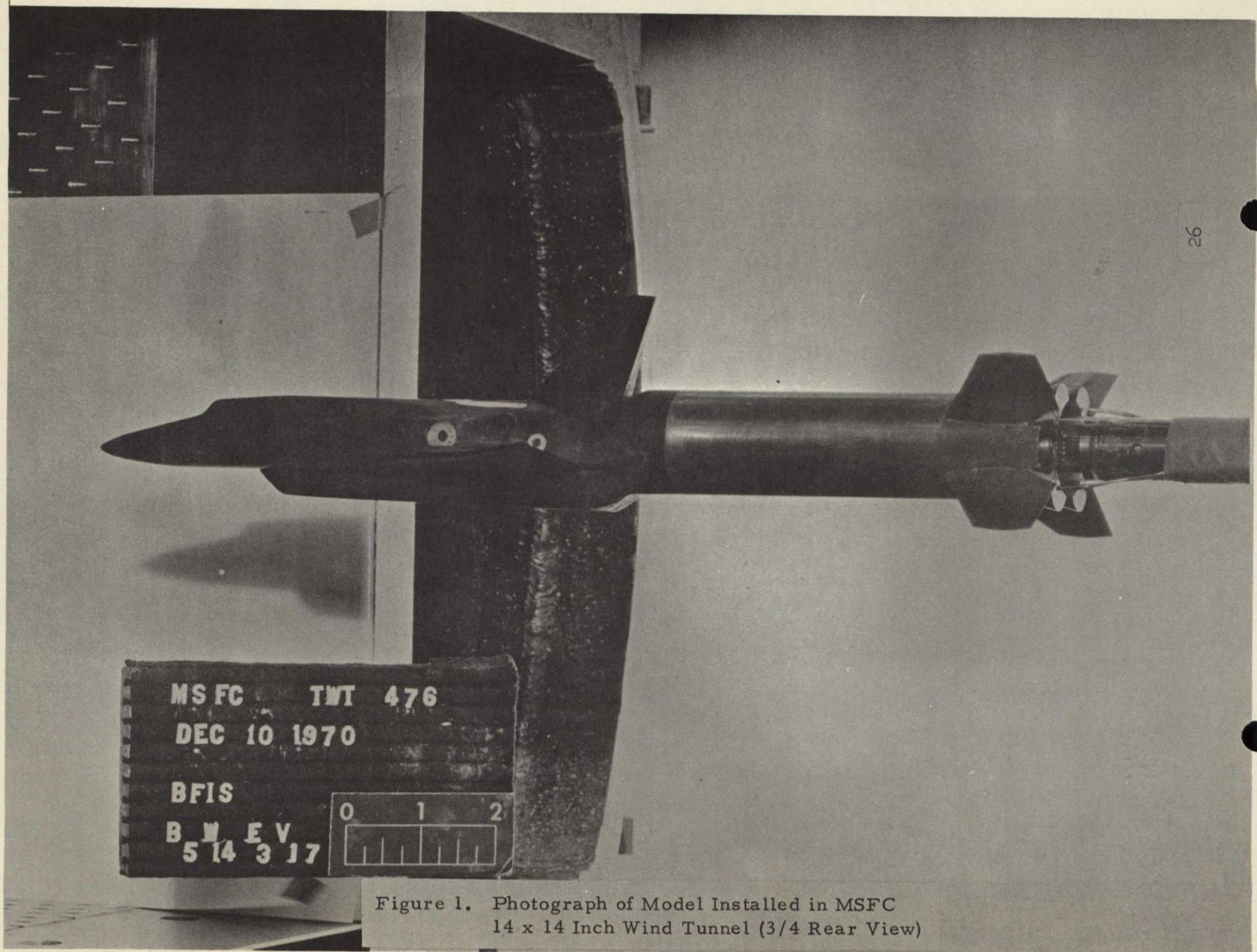


Figure 1. Photograph of Model Installed in MSFC
14 x 14 Inch Wind Tunnel (3/4 Rear View)

NOT REPRODUCIBLE

27

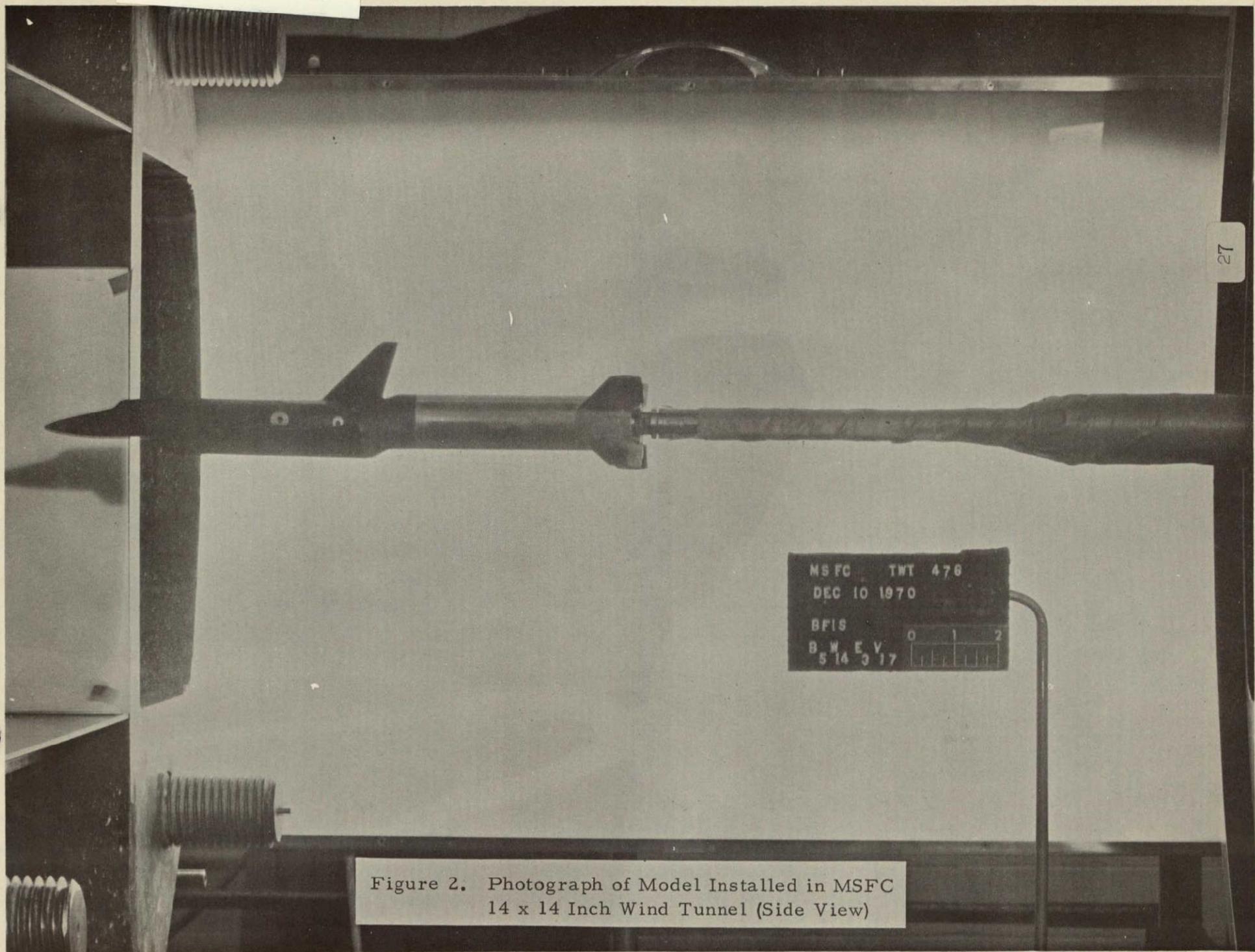


Figure 2. Photograph of Model Installed in MSFC
14 x 14 Inch Wind Tunnel (Side View)

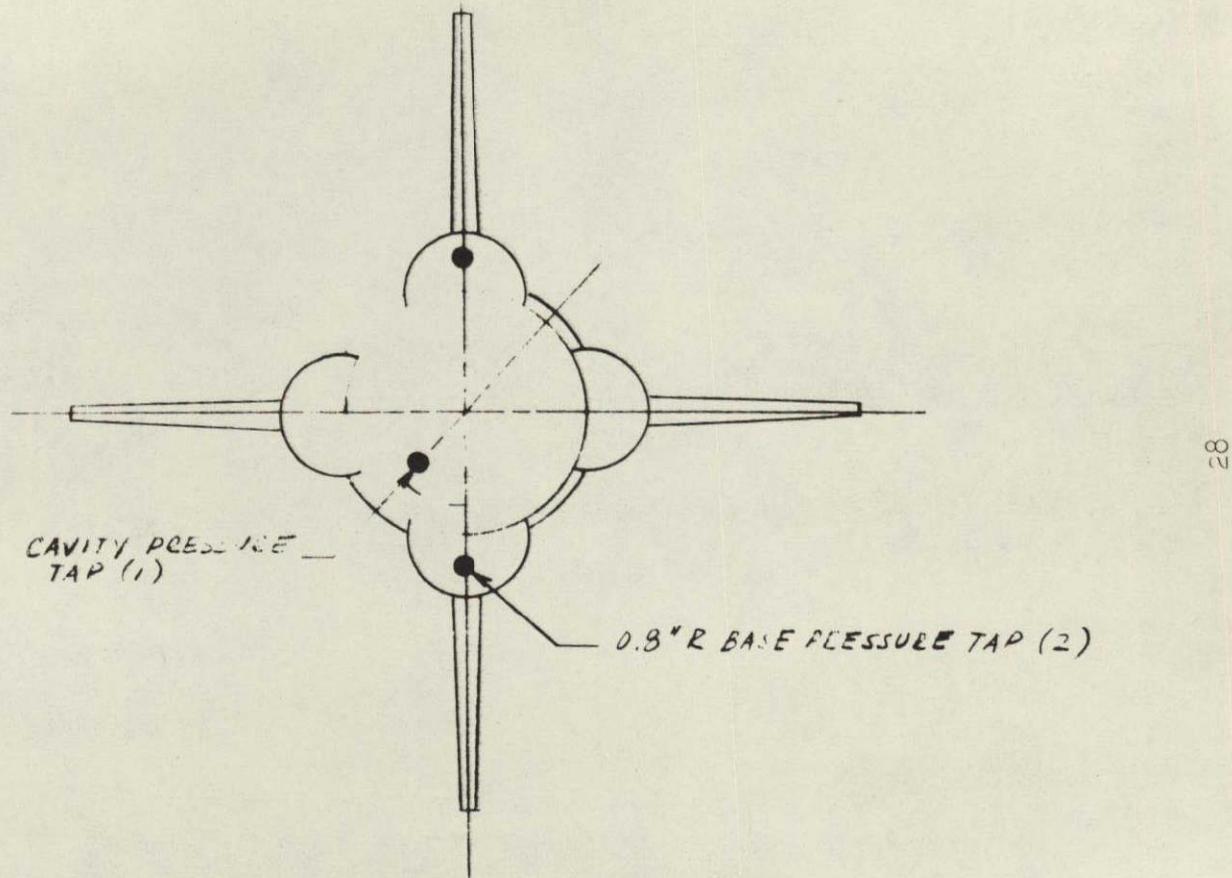
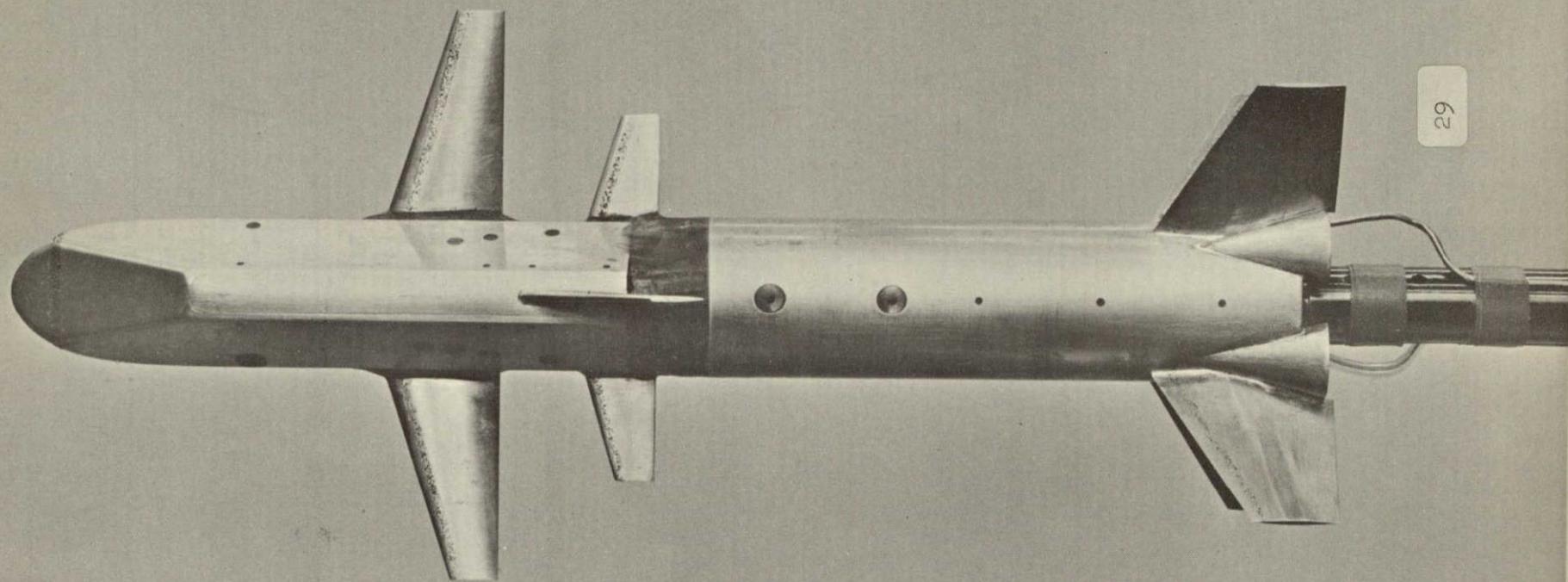


FIGURE 3. TYPICAL BASE PRESSURE LOCATIONS

NOT REPRODUCIBLE



TWT 470 - 1.2
NOV 10 1970
CONFIG
BF, O WHVS 0 1 2

FIGURE 4 TOP VIEW OF MODEL SHOWING TRIP STRIP DETAILS

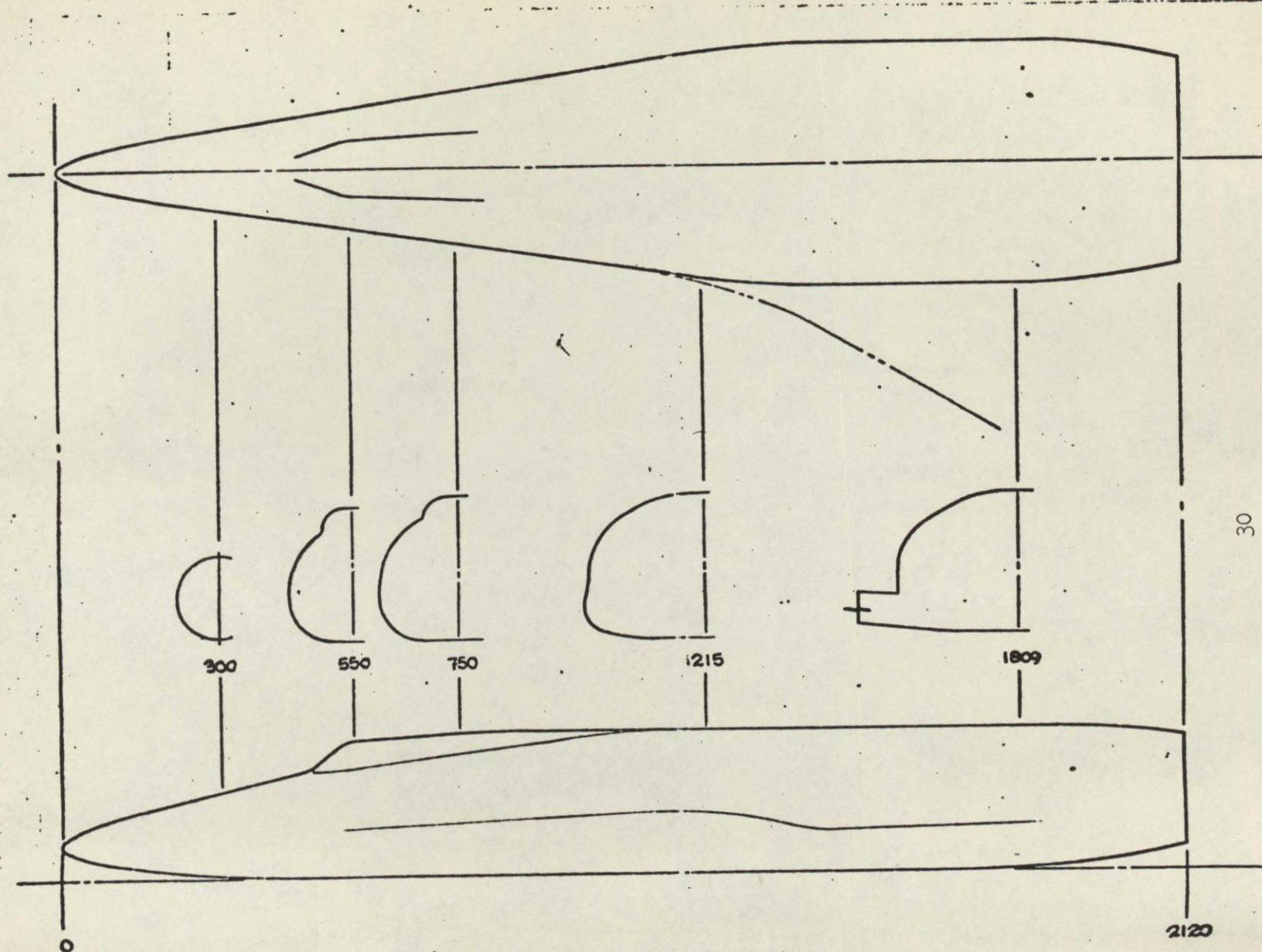
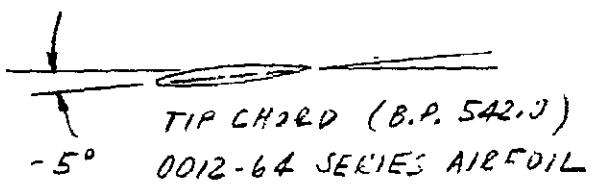
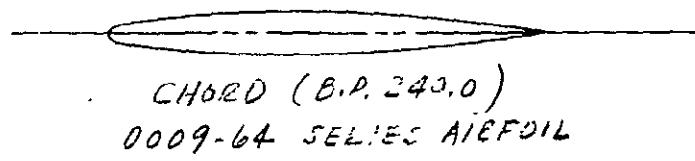
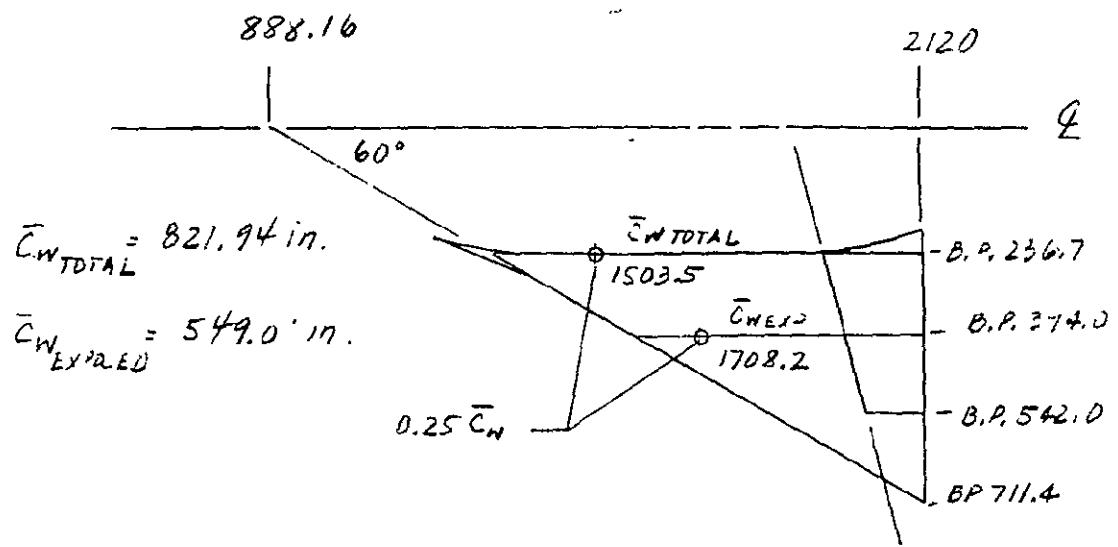


FIGURE 5. BODY BS 9902-134B CONFIGURATION



NOTE: ALL DIMENSIONS ARE
FULL SCALE (INCHES)

FIGURE 6. WING W14 9992-134B CONFIGURATION
COMPLETE DELTA - NO CLIPPED TIP

NOTE: ALL DIMENSIONS ARE FULL
SCALE (INCHES)

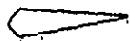
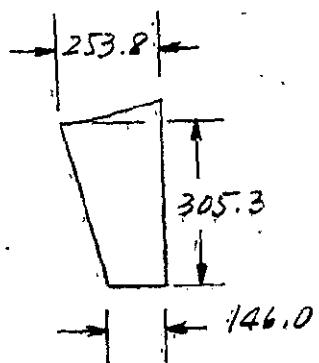


FIGURE 7. ELEVON E3 - ELEVON USED WITH WING W14

NOTE: ALL DIMENSIONS ARE
FULL SCALE (INCHES)

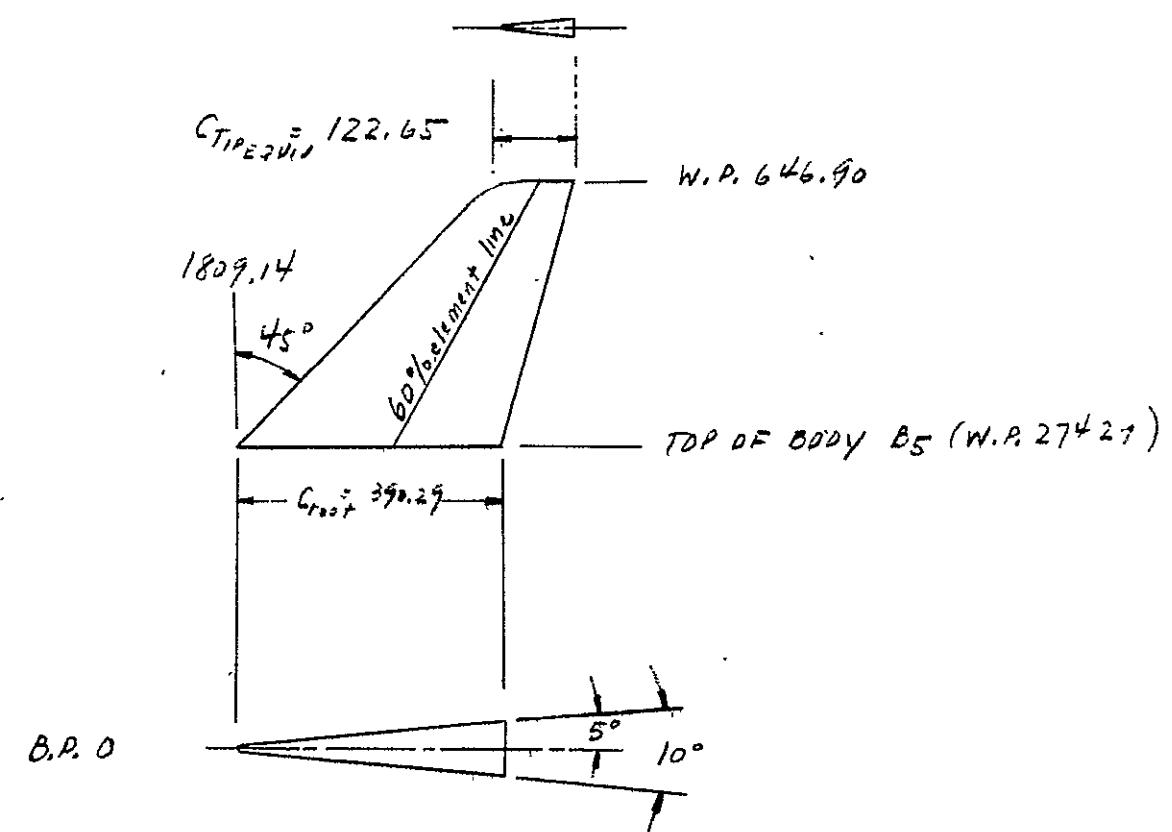


FIGURE 8. VERTICAL STABILIZER V17

NOTE: ALL DIMENSIONS ARE
MODEL SCALE (INCHES)

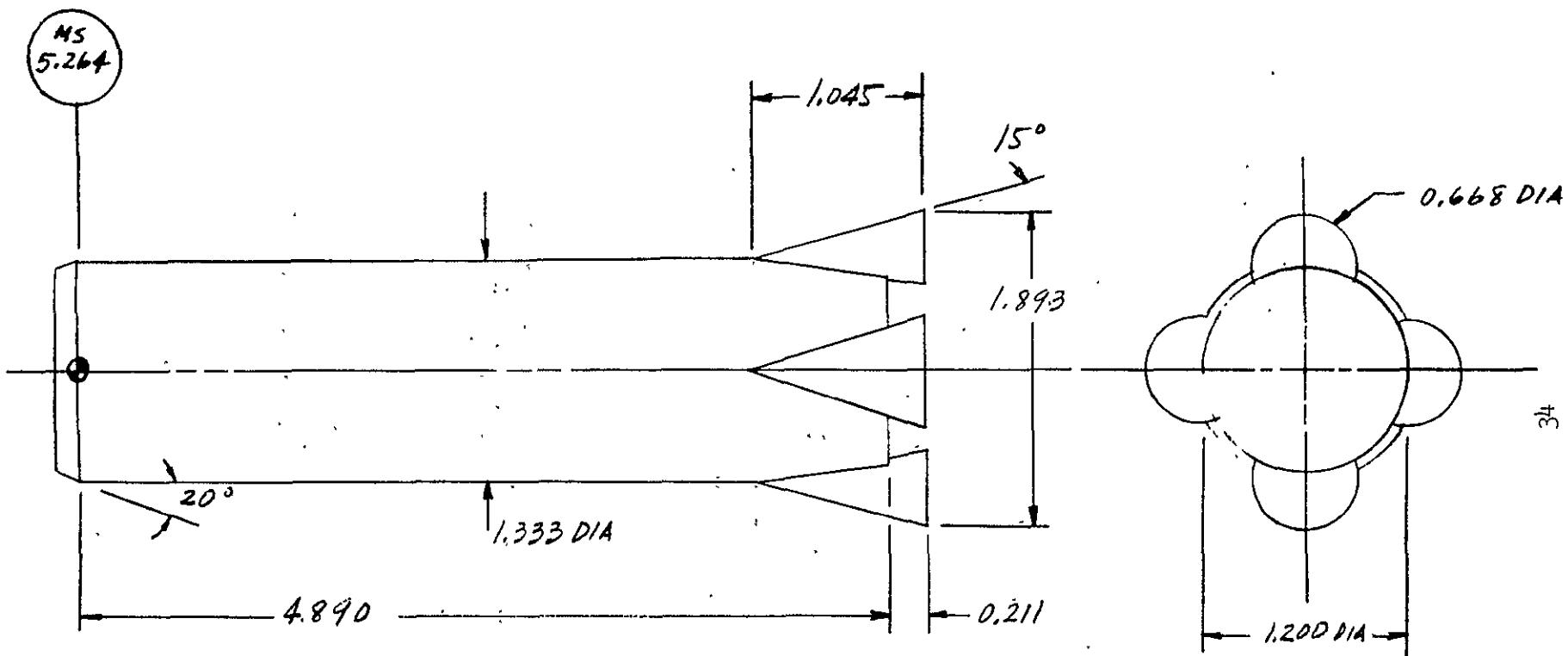


FIGURE 9. SATURN V/SIC BOOSTER

NOTE: ALL DIMENSIONS ARE
MODE SCALE (INCHES)

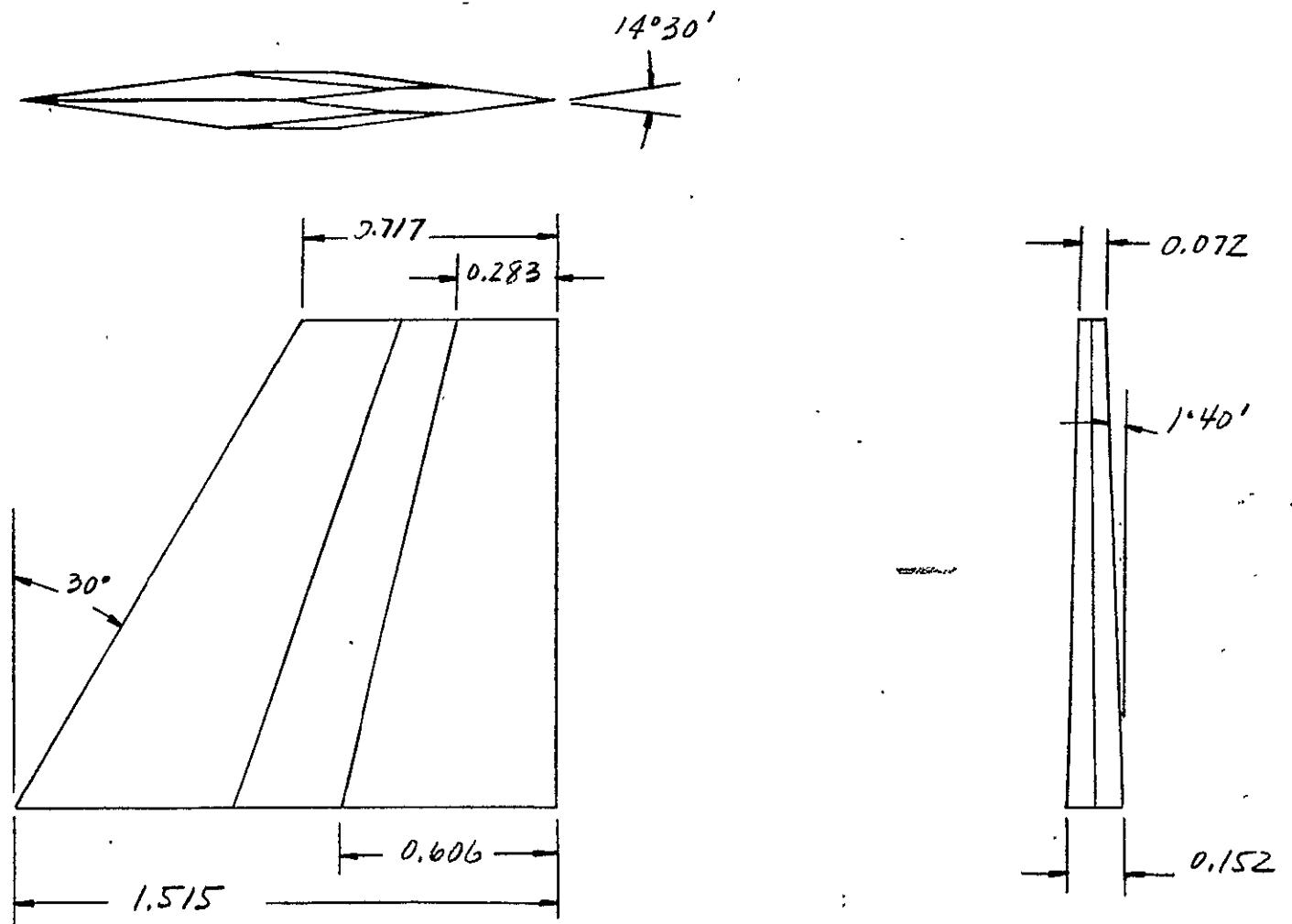
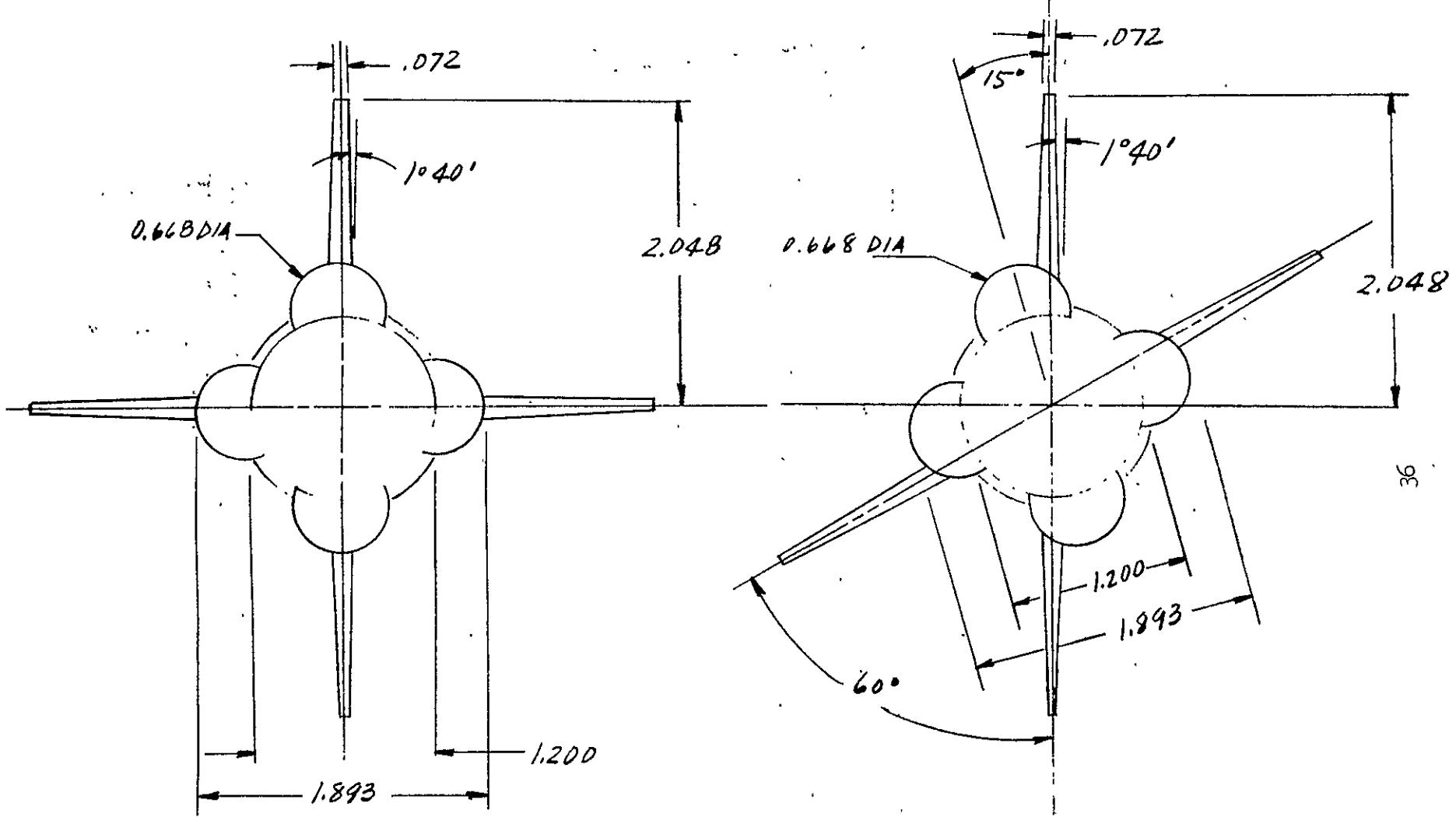


FIGURE 10. 900 FT^2 S-IC FIN

NOTE: ALL DIMENSIONS ARE
MODEL SCALE (INCHES)



S-IC 45° FIN CONFIGURATION
(F_2).

S-IC 30° FIN CONFIGURATION
(F_1).

FIGURE 10 (CONTINUED)

Notes:

1. Positive directions of force coefficients moment coefficients, and angles are indicated by arrows.
2. For clarity, origins of wind and stability axes have been displaced from the center of gravity.

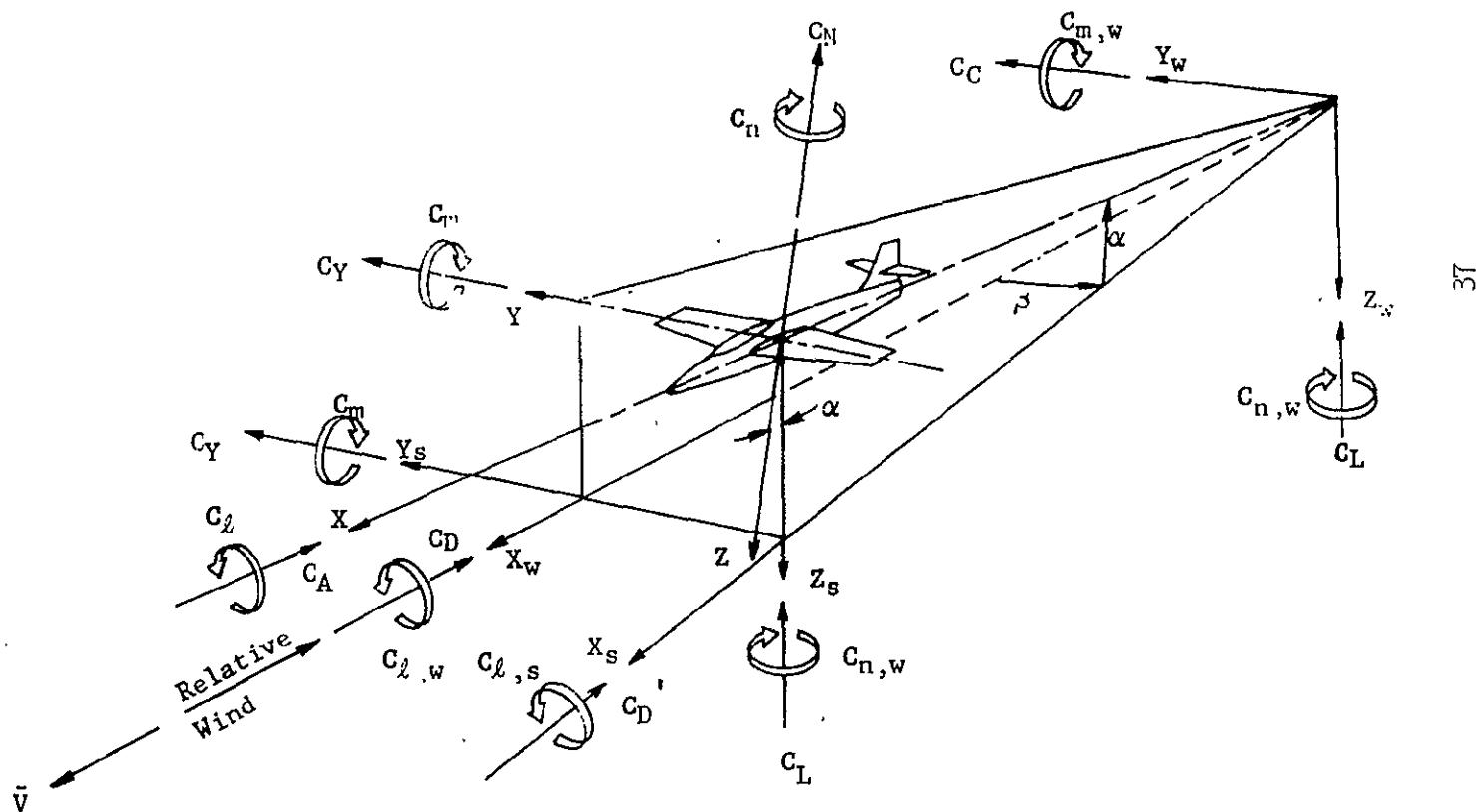


Figure 11. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

DATA DISPLAY INDEX

DATA PLOT INDEX

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY
DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
R25U21	CN	ALPHA	1 - 2
R25021	CLM	ALPHA	3 - 4
R25021	CAF	ALPHA	5 - 6
R25021	CPB1	ALPHA	7 - 8
R25021	CPB2	ALPHA	9 - 10
R25021	CPCAV	ALPHA	11 - 12
R25031	CN	ALPHA	13 - 14
R25031	CLM	ALPHA	15 - 16
R25031	CAF	ALPHA	17 - 18
R25031	CPB1	ALPHA	19 - 20
R25031	CPB2	ALPHA	21 - 22
R25031	CPCAV	ALPHA	23 - 24
R25041	CN	ALPHA	25 - 26
R25041	CLM	ALPHA	27 - 28
R25041	CAF	ALPHA	29 - 30
R25041	CPB1	ALPHA	31 - 32
R25041	CPB2	ALPHA	33 - 34
R25041	CPCAV	ALPHA	35 - 36
R25061	CN	ALPHA	37 - 38
R25061	CLM	ALPHA	39 - 40
R25061	CAF	ALPHA	41 - 42
R25061	CPB1	ALPHA	43 - 44
R25061	CPB2	ALPHA	45 - 46
R25061	CPCAV	ALPHA	47 - 48
R25071	CN	ALPHA	49 - 50
R25071	CLM	ALPHA	51 - 52
R25071	CAF	ALPHA	53 - 54
R25071	CPB1	ALPHA	55 - 56
R25071	CPB2	ALPHA	57 - 58
R25071	CPCAV	ALPHA	59 - 60
R25081	CN	ALPHA	61 - 62
R25081	CLM	ALPHA	63 - 64
R25081	CAF	ALPHA	65 - 66
R25081	CPB1	ALPHA	67 - 68
R25081	CPB2	ALPHA	69 - 70
R25081	CPCAV	ALPHA	71 - 72
R25091	CN	ALPHA	73 - 74
R25091	CLM	ALPHA	75 - 76
R25091	CAF	ALPHA	77 - 78
R25091	CPB1	ALPHA	79 - 80
R25091	CPB2	ALPHA	81 - 82
R25091	CPCAV	ALPHA	83 - 84

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY
DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE
			BEGINNING / ENDING
R25021	CLM	CN	85 86
R25031	CLM	CN	87 88
R25041	CLM	CN	89 90
R25061	CLM	CN	91 92
Z25071	CLM	CN	93 94
R25081	CLM	CN	95 96
R25091	CLM	CN	97 98

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY
DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASET PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE
825021	CN	MACH	99
825021	CLM	MACH	100
825021	CLM/CN	MACH	101
B25031	CN	MACH	102
B25031	CLM	MACH	103
B25031	CLM/CN	MACH	104
B25041	CN	MACH	105
B25041	CLM	MACH	106
B25041	CLM/CN	MACH	107
B25061	CN	MACH	108
B25061	CLM	MACH	109
B25061	CLM/CN	MACH	110
B25071	CN	MACH	111
B25071	CLM	MACH	112
B25071	CLM/CN	MACH	113
B25081	CN	MACH	114
B25081	CLM	MACH	115
B25081	CLM/CN	MACH	116
B25091	CN	MACH	117
B25091	CLM	MACH	118
B25091	CLM/CN	MACH	119

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY
DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
N25021	CAF	MACH	120 120
N25031	CAF	MACH	121 121
N25041	CAF	MACH	122 122
N25061	CAF	MACH	123 123
N25071	CAF	MACH	124 124
N25081	CAF	MACH	125 125
N25091	CAF	MACH	126 126

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY
MACH DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASET PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE(2)	PLOT PAGE
A25021	CLMCNO	MACH	127
A25031	CLMCNO	MACH	128
A25041	CLMCNO	MACH	129
A25061	CLMCNO	MACH	130
A25071	CLMCNO	MACH	131
A25081	CLMCNO	MACH	132
A25091	CLMCNO	MACH	133

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY
DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
CY	BETA	134 140
CYN	BETA	141 147
CBL	BETA	148 154
CPB1	BETA	155 161
CPB2	BETA	162 168
CPCAV	BETA	169 175

NR DELTA WING ORBITER/SATURN V S-IIC BOOSTER, LATERAL-DIRECTIONAL STABILITY
DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
CY	CYN	176 182

NR DELTA WING ORBITER/SATURN V S-IIC BOOSTER, LATERAL-DIRECTIONAL STABILITY
GRADIENT OF A DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,
MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

GRADIENT OF DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE
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CYN	MACH	184
CBL	MACH	185

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE; PARAMETRIC STUDY

DATASETS PLOTTED:
A25041 A25021 A25031

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
CN	ALPHA	186 192
CLM	ALPHA	193 199
CAF	ALPHA	200 206

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED: A25041 A25021 A25031

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
CLM	CN	207 213

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

UNIVARIATE DEPENDENT VARIABLE VS PARAMETRIC VARIABLE,
PARAMETRIC STUDY

DATASETS PLOTTED: A25041 A25021 A25031

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING / ENDING
CLMCNO	ORBINC	214 215

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED: A25081 A25061 Q25071

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CLM	ALPHA	223 229
CAF	ALPHA	230 236

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:

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DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
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CLM CN

237 243

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

UNIVARIATE DEPENDENT VARIABLE VS. PARAMETRIC VARIABLE,
PARAMETRIC STUDY

DATASETS PLOTTED:

A25081 A25061 Q25071

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING / ENDING
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CLMCNO ORBINC

244 245

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY.

DEPENDENT VARIABLE VS. INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:

R25021 R25091

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
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CLM	CN	246	252
CAF	CLM	253	259
CAF	ALPHA	260	266

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY.

DEPENDENT VARIABLE VS. DEPENDENT VARIABLE, MULTIPLE DATASETS

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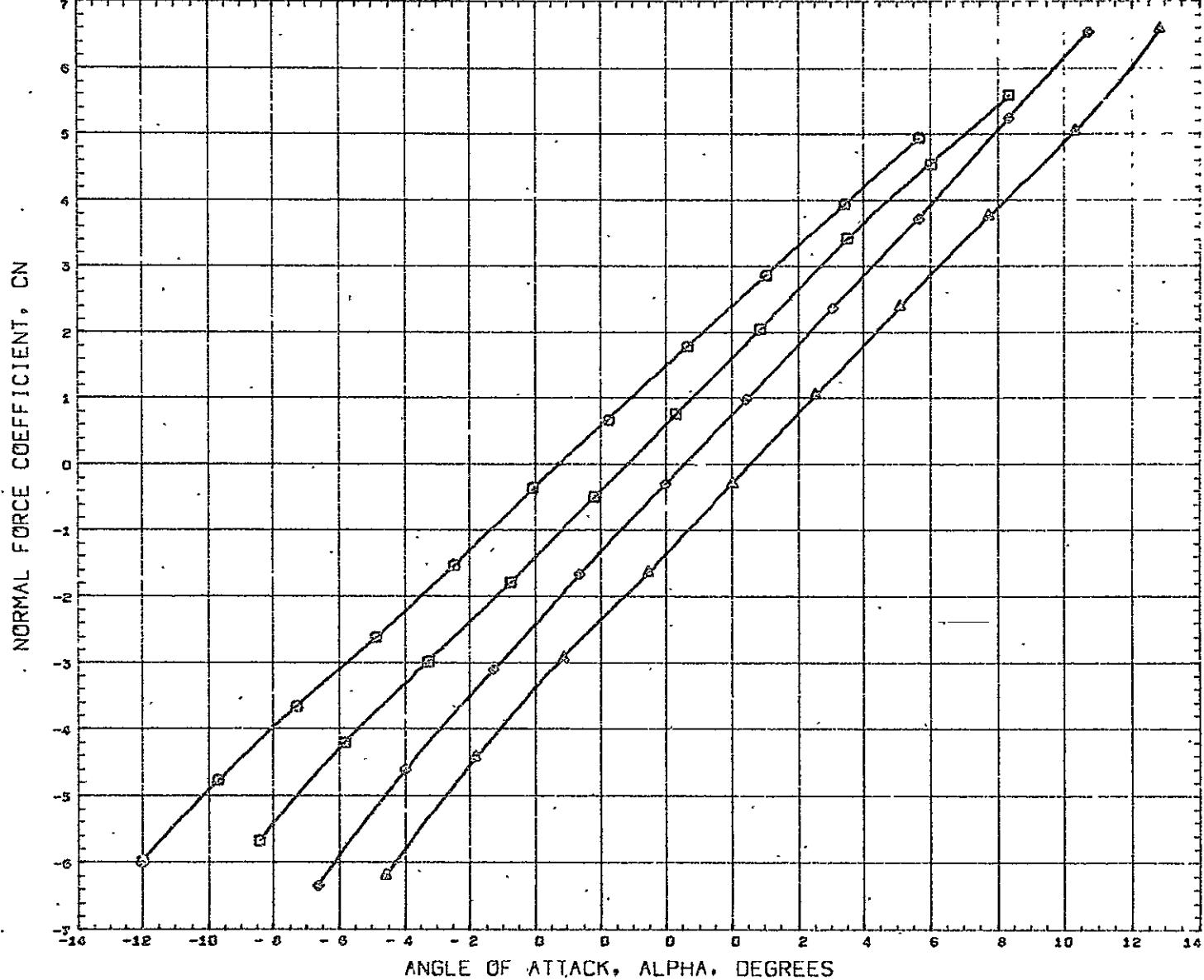
R25021 R25091

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING / ENDING
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CLM	CN	267	273
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DATA

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			REFERENCE INFORMATION			
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○	0.600					REFL	1.3350	INCHES
□	0.896					REFB	1.3330	INCHES
◊	0.994					XMRP	5.2640	INCHES
△	1.106					YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

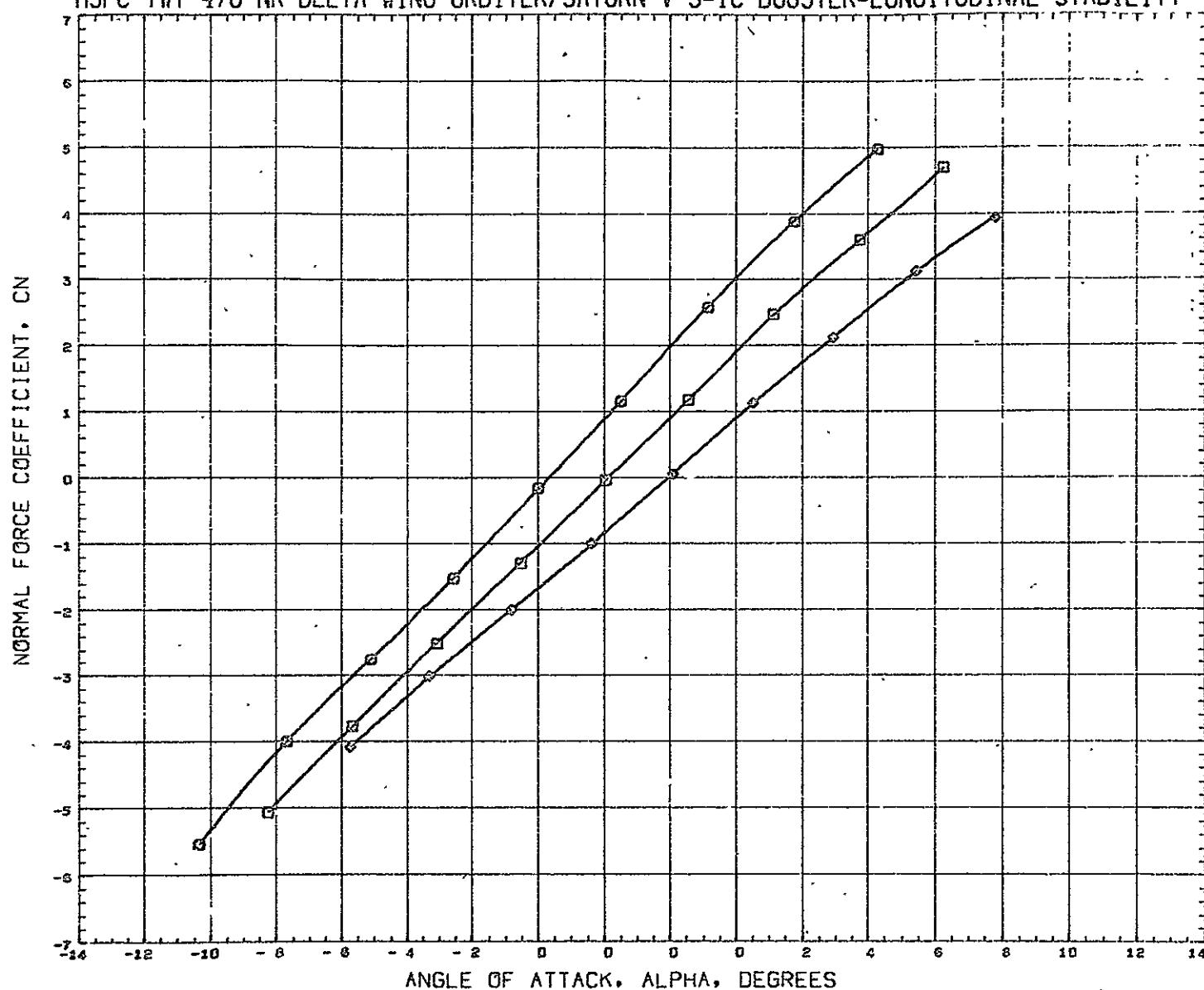
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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



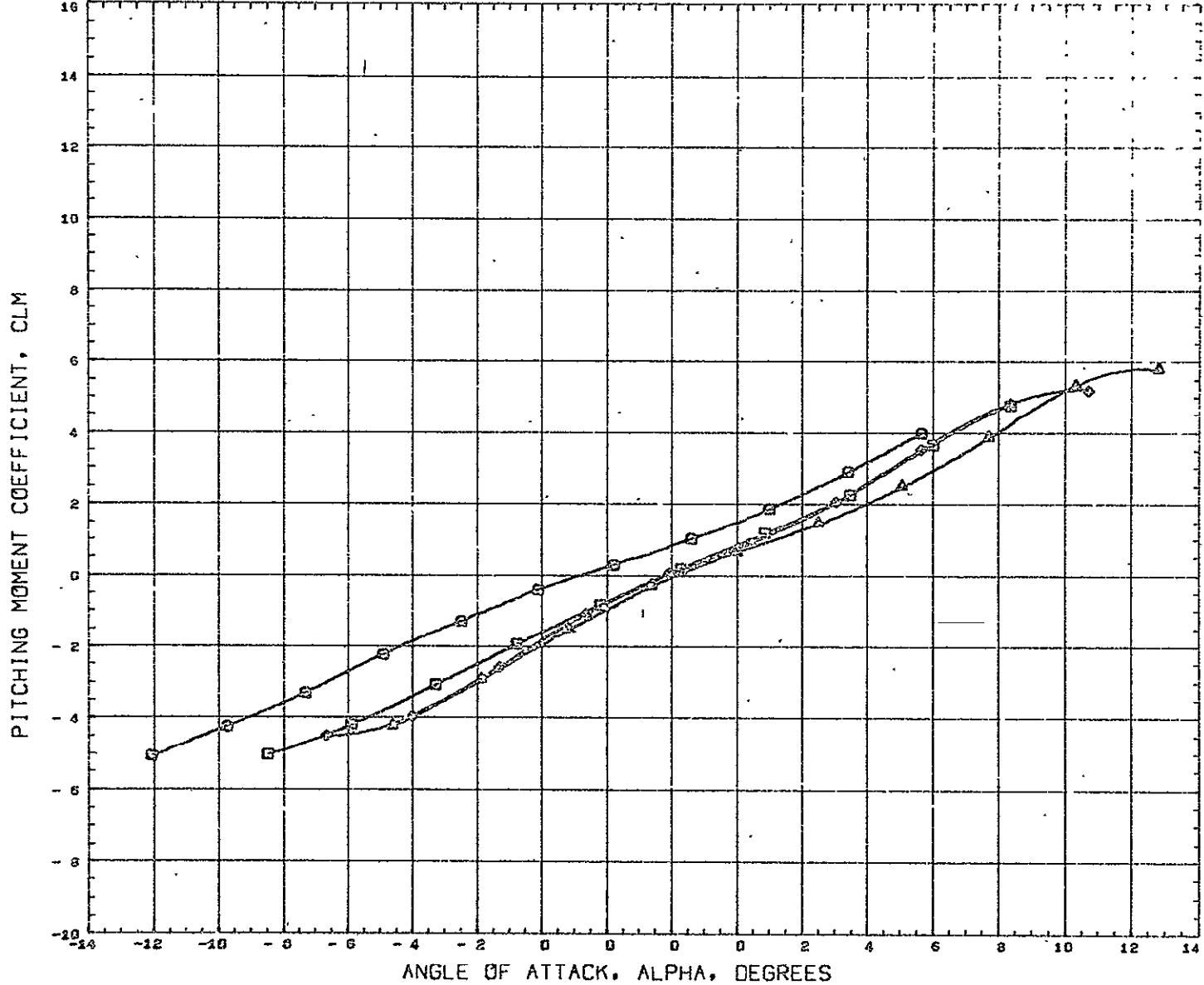
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\square	-	1.465			
\diamond	-	1.952			

REFERENCE INFORMATION		
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CFB	1.3330	INCHES
IRP	5.2640	INCHES
IRP	0.0000	INCHES
IRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	HACH	PARAMETRIC VALUES		
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○	0.600			1.000
□	0.896			
◊	0.994			
△	1.106			

REFERENCE INFORMATION		
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FL	1.3330	INCHES
FB	1.3330	INCHES
RP	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

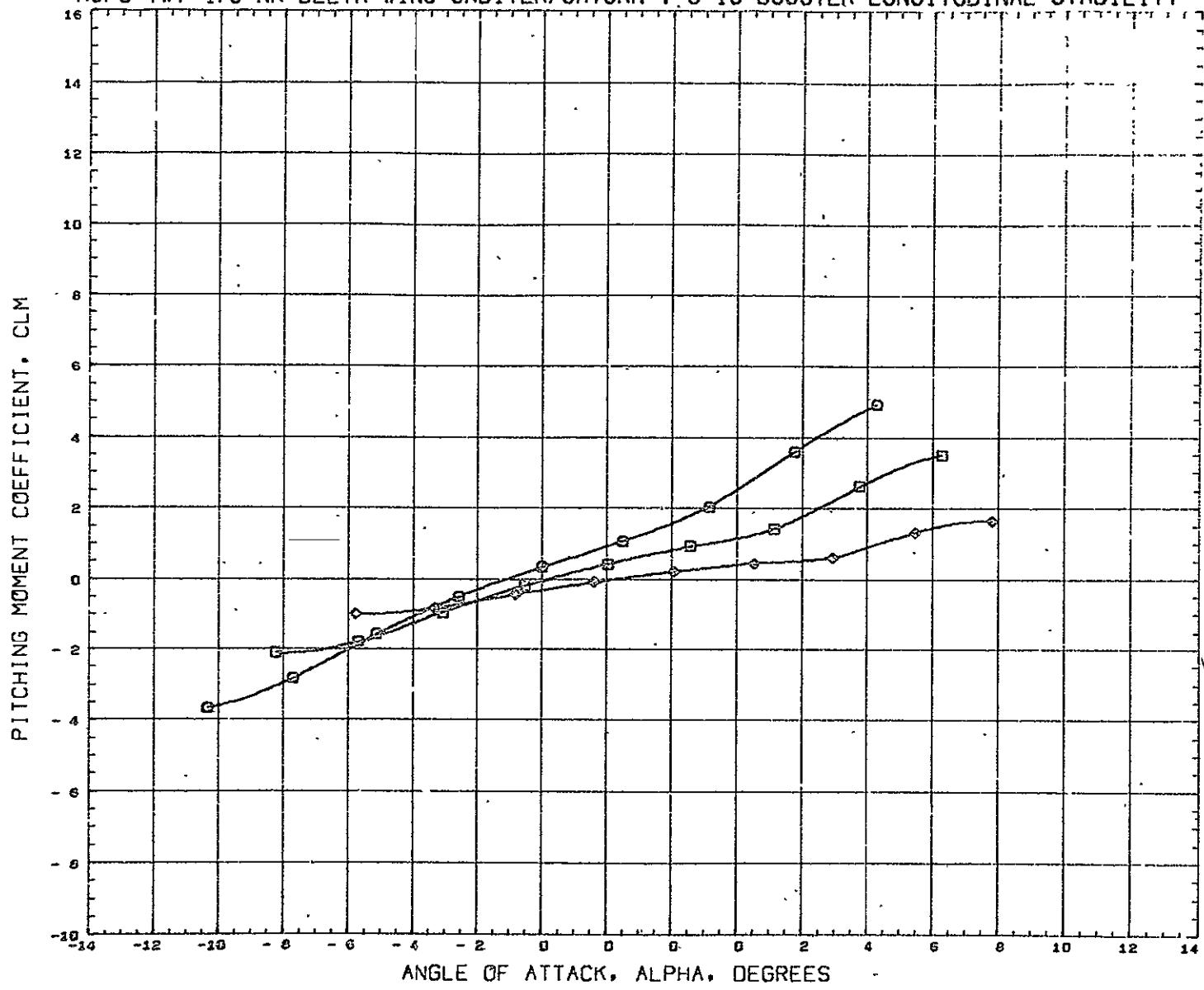
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MSFC 476 NR HCR0RB/S-ICBOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71

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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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○	1.198		1.000	
□	1.465			
◊	1.952			

REFERENCE INFORMATION		
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REFB	1.3330	INCHES
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TMRP	0.0000	INCHES
MTRP	0.0330	INCHES
SCALE	0.0034	

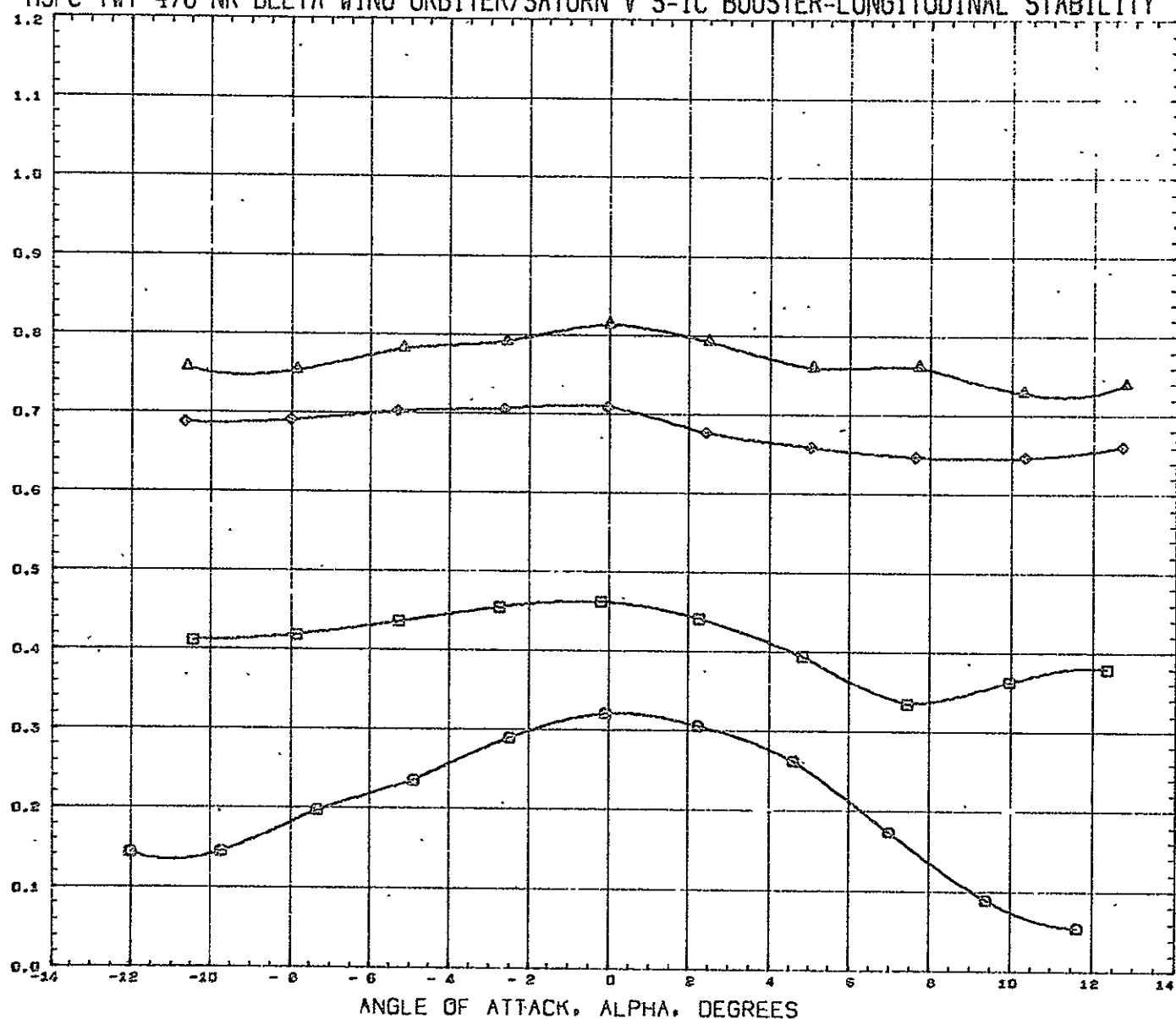
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MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 [R25021] 08 JAN 71

PAGE

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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	G.02B	ORBINC
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□	0.898			
◊	0.994			
△	1.105			

REFERENCE INFORMATION		
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EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
MRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

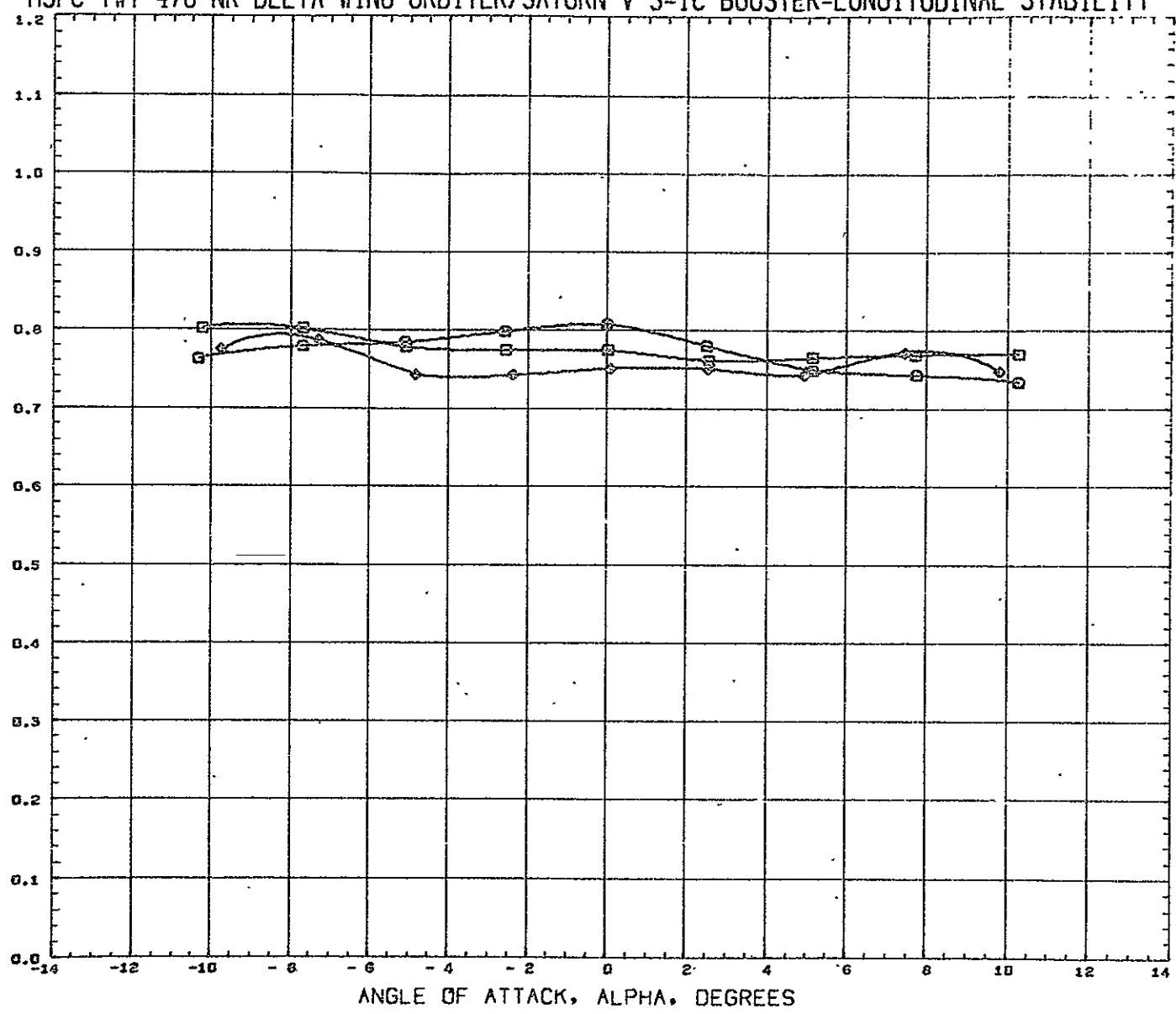
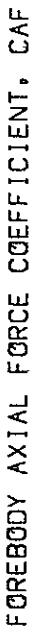
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MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25021) 08 JAN 71

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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
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□	1.198			1.000
□	1.465			
◊	1.952	.		

REFERENCE INFORMATION		
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FB	1.3330	INCHES
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HRF	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

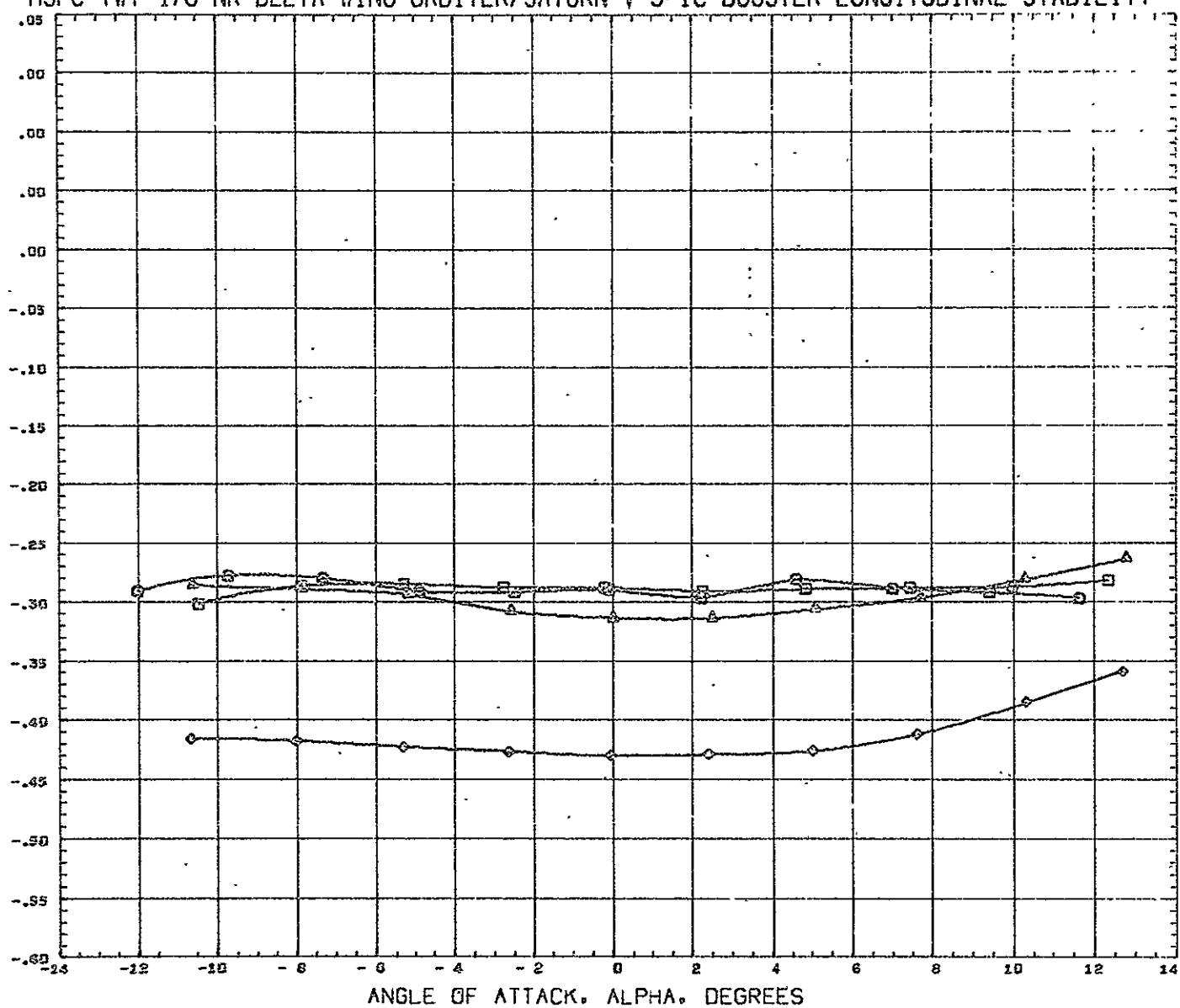
MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71

PAGE

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MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB1



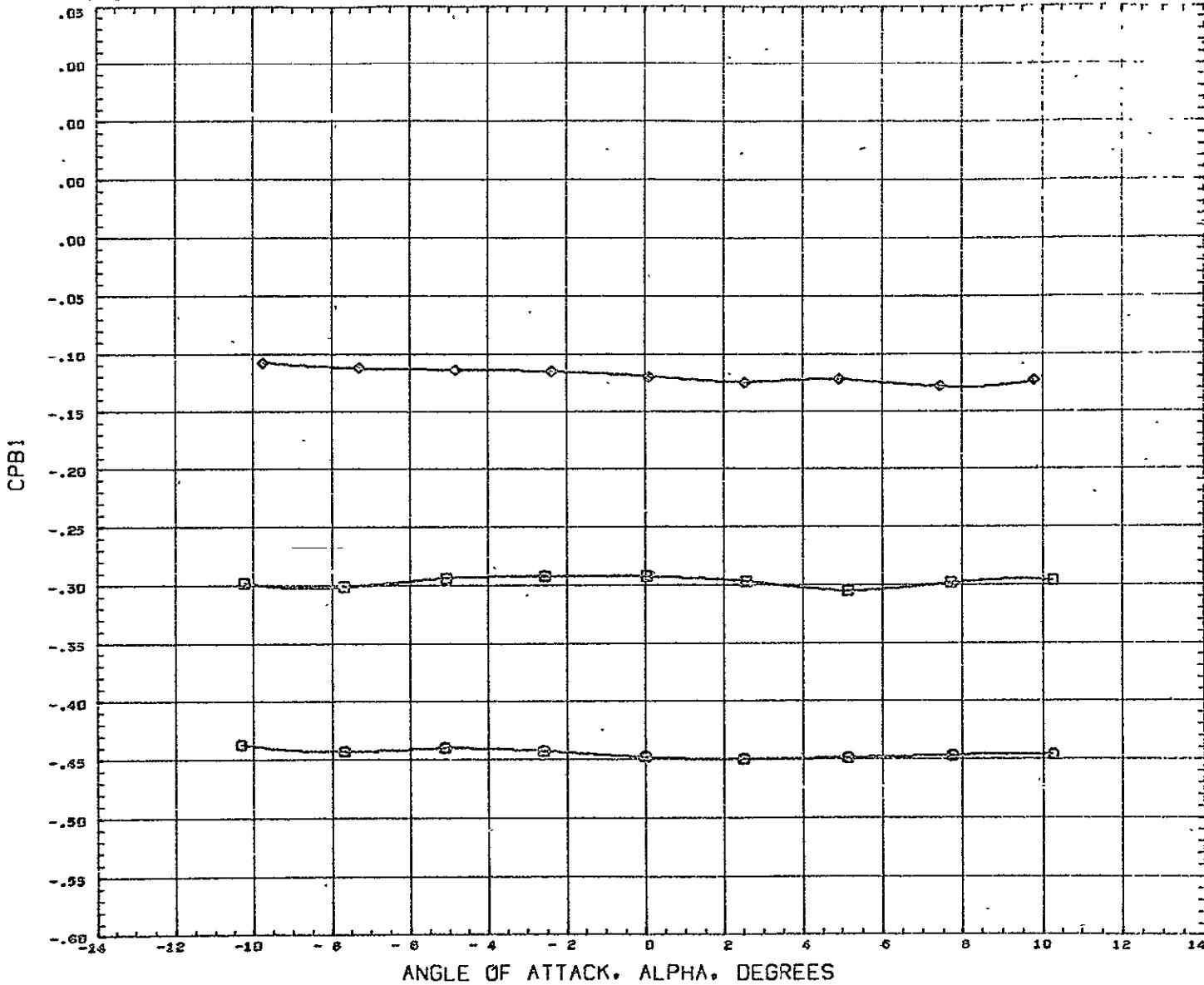
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	HACH		PARAMETRIC VALUES		
	B	C	D	E	F
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◊	0.994				
△	1.106				

DATA MIST. CODE NH

REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARANETRIC VALUES
O	1.198		0.020 ORBINC 1.000
O	1.465		
O	1.952		

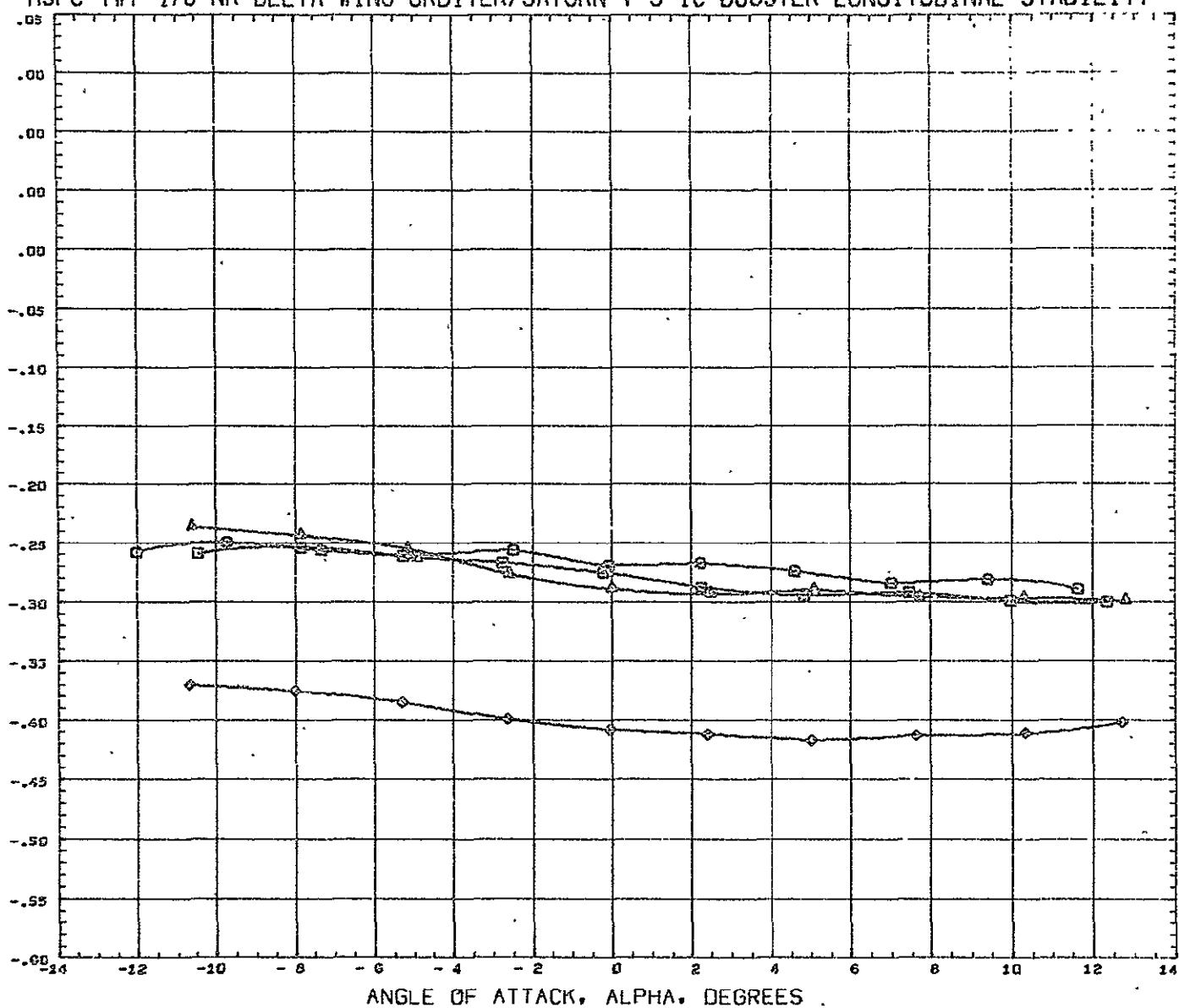
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FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RP	0.0330	INCHES
RALE	0.0034	

DATA HIST. CODE NM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 8

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB2



ANGLE OF ATTACK, ALPHA, DEGREES .

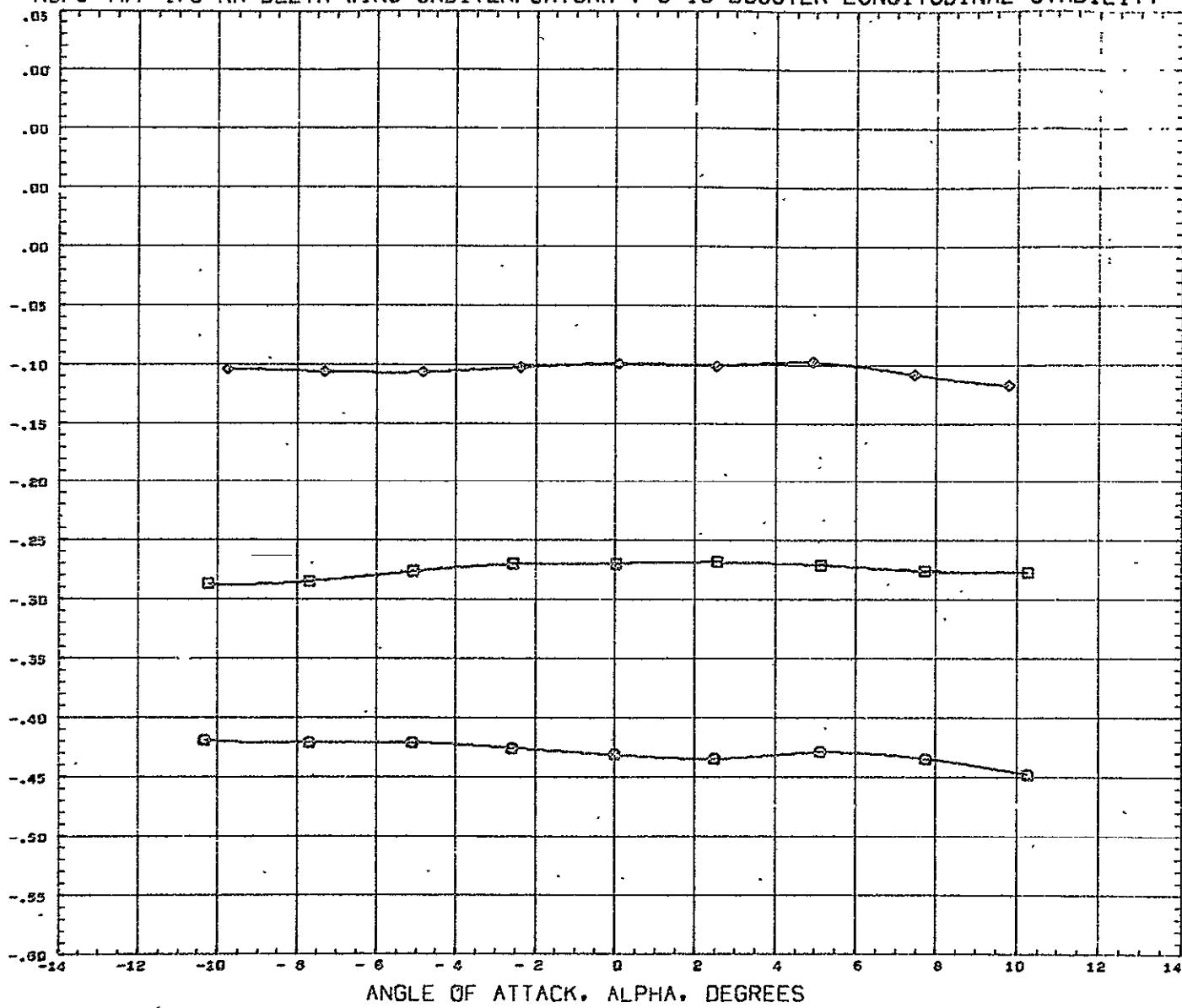
SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	0.600	0.020	REFS 1.3960
□	0.698	0.020	REFL 1.3330
◆	0.994	0.020	REFB 1.3330
△	1.106	0.020	XHRP 5.2640
			YHRP 0.0000
			ZHRP 0.0330
			SCALE 0.0034

DATA MIST. CODE NH

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRP 5.2640 INCHES
YHRP 0.0000 INCHES
ZHRP 0.0330 INCHES
SCALE 0.0034

乙

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



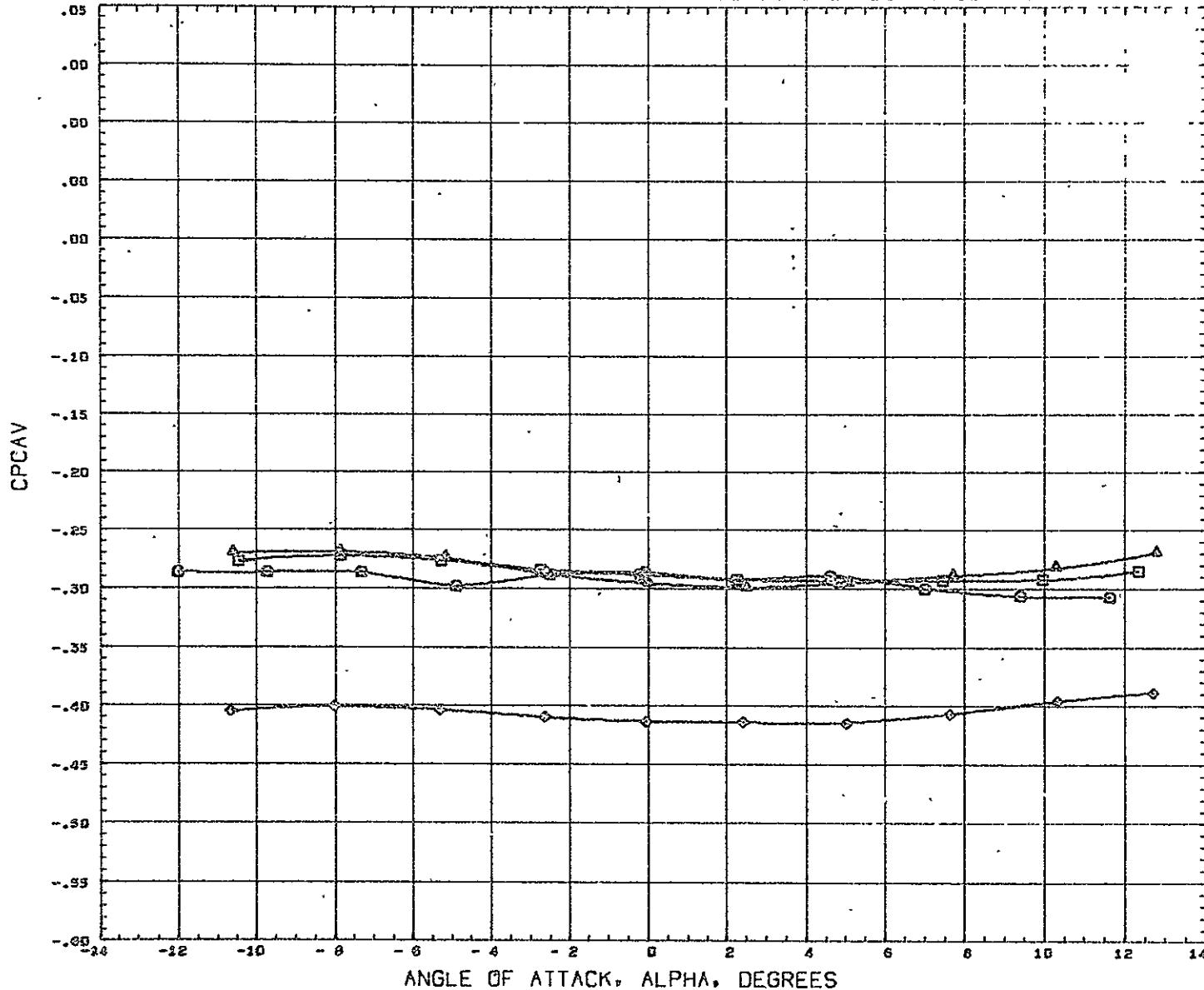
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.020	ORBINC
□	1.198			1.000
□	1.465			
◊	1.952			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
NRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE NH

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 10

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



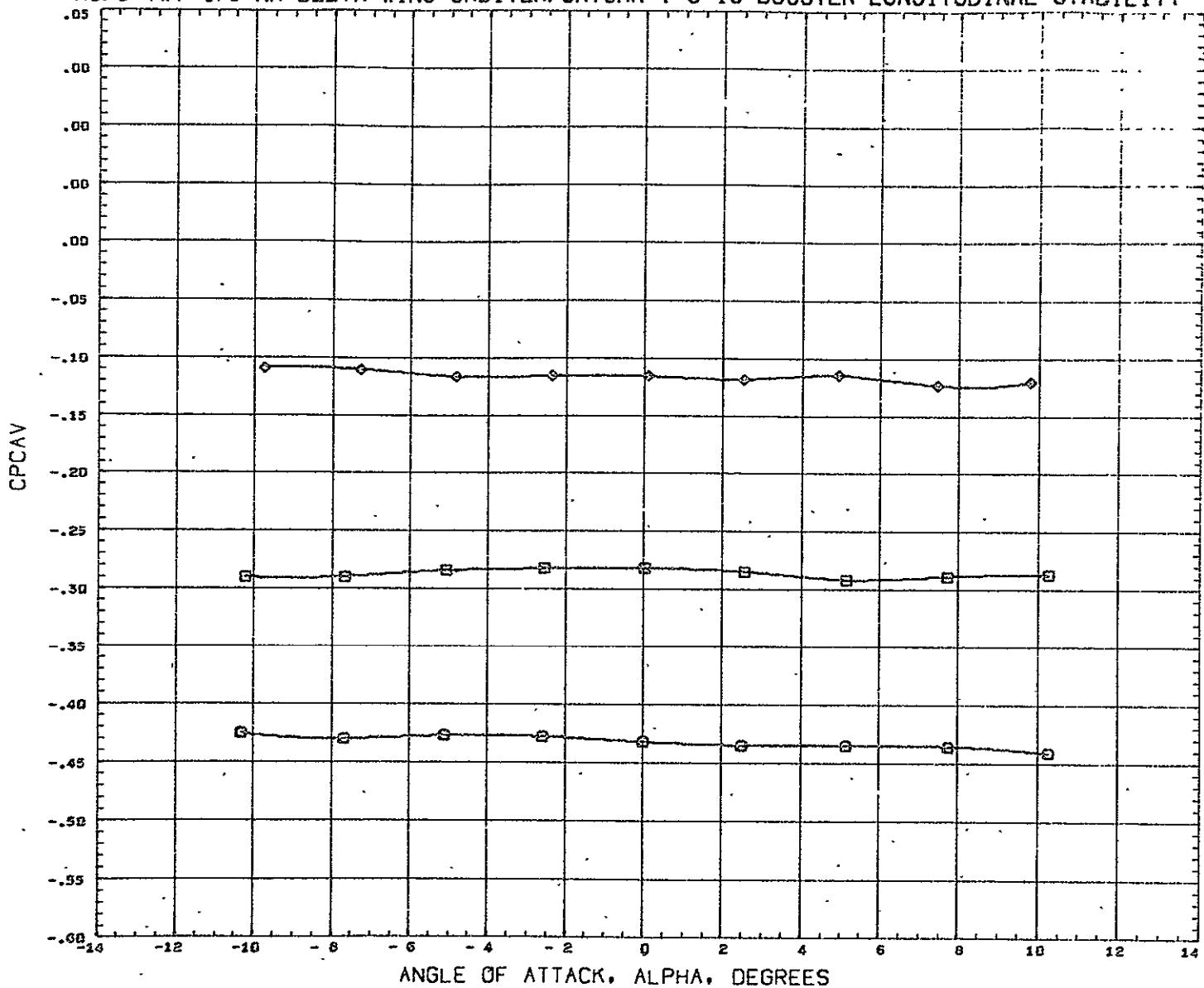
SYMBOL	HACH	BETA	PARAMETRIC VALUES
○	0.600		0.020 ORBINC 1.000
□	0.895		
◊	0.995		
△	1.106		

DATA HIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZMRF	0.0350	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 11

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



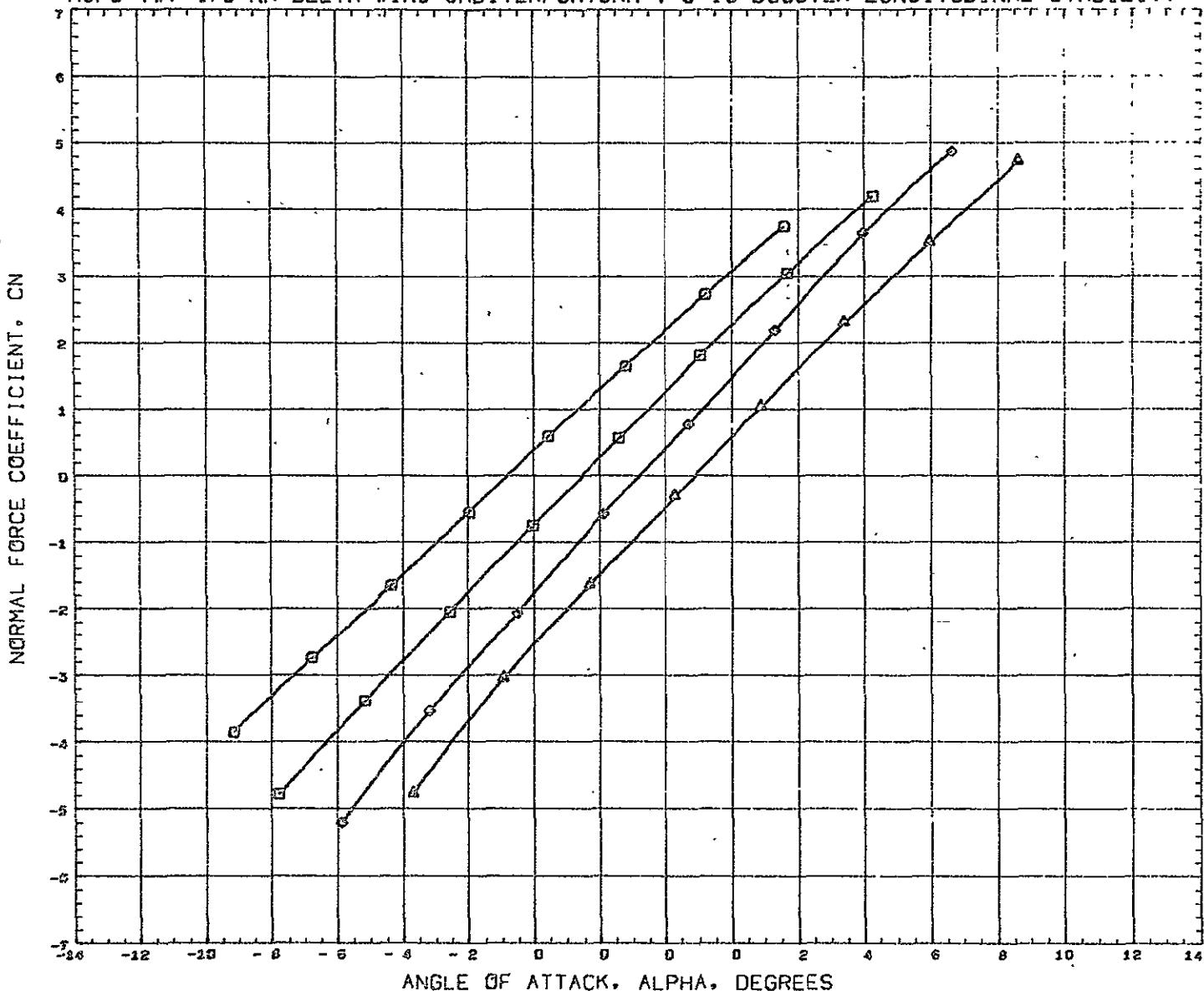
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	G.020	ORBINC
□	1.198		0.020	1.000
□	1.465			
◊	1.952			

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMF	9.2640	INCHES
YHMF	0.0000	INCHES
ZHMF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-1C800STER BF1S+B5W14E3V17 CR250210 08 JAN 71 PAGE 12

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



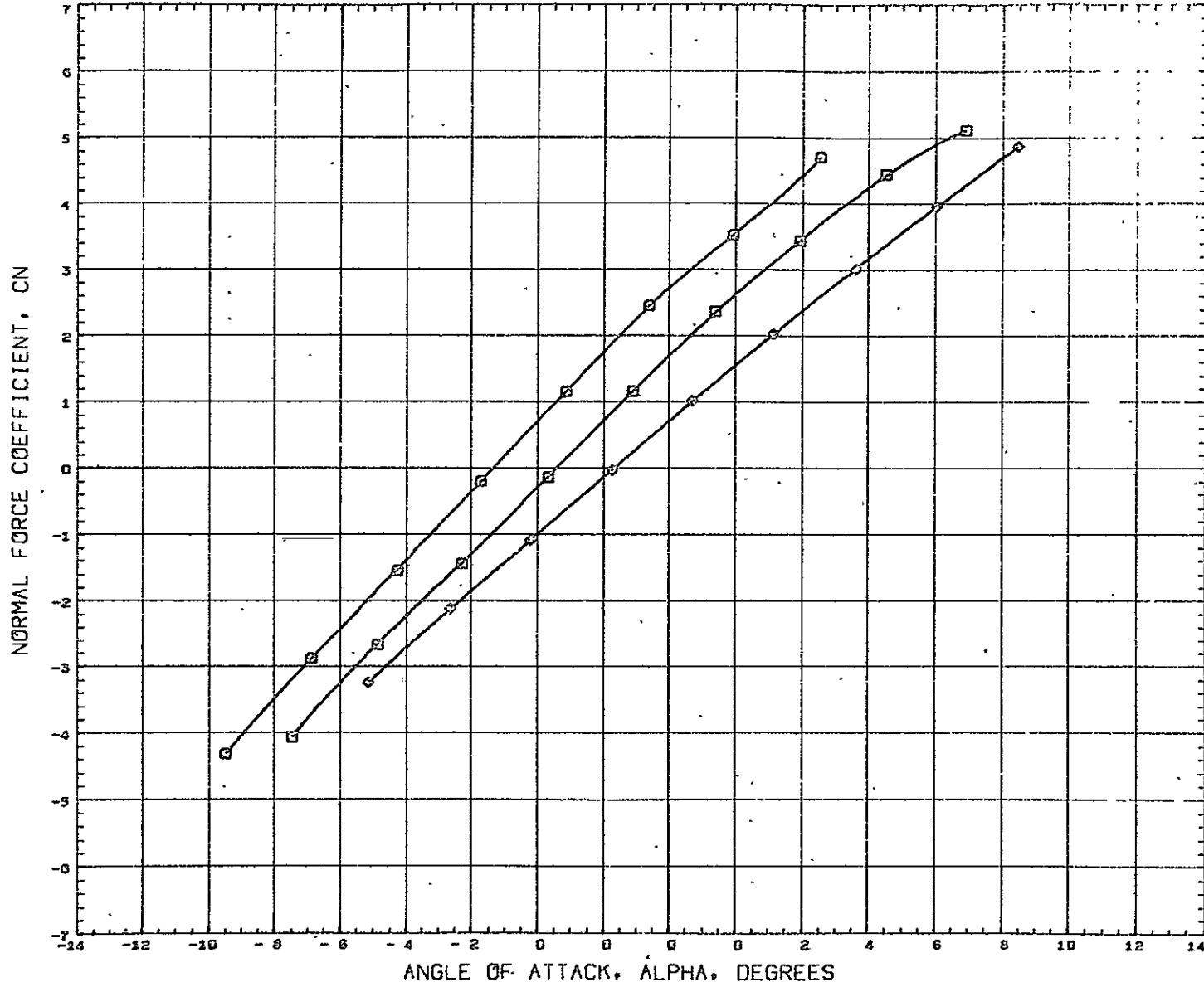
		PARAMETRIC VALUES				
SYMBOL	BACH	BETA	-	0.020	ORBINC	4.000
○	0.599					
□	0.895					
◊	0.993					
△	1.098					

REFERENCE INFORMATION		
CS	1.3960	SQ.IN.
CFL	1.3330	INCHES
CFB	1.3330	INCHES
HRP	5.2640	INCHES
HRP	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 13

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	- D.020	ORBINC
□	1.200			4.000
□	1.454			
◊	1.953			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

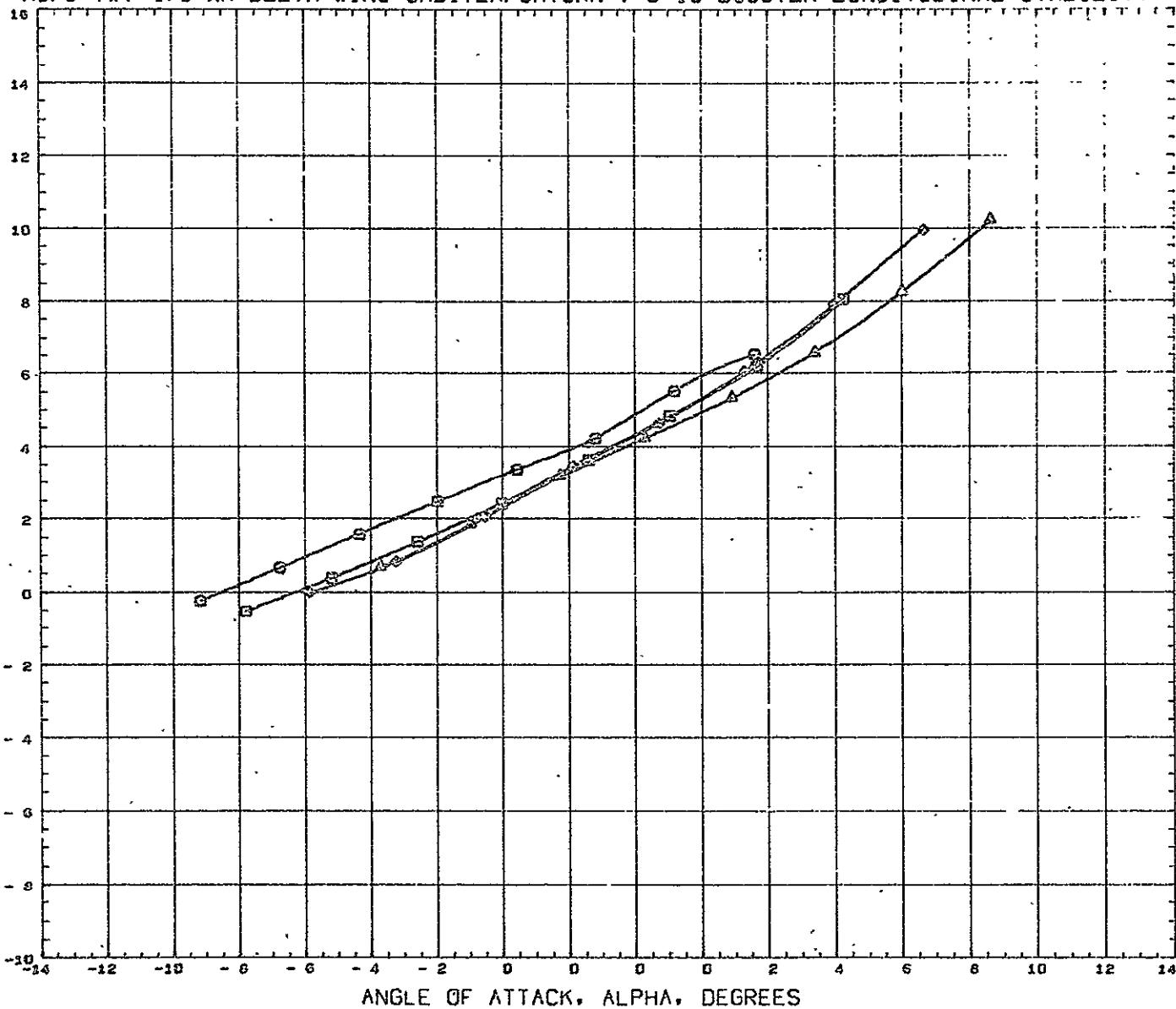
DATA HIST. CODE MH

MSFC 476 NR HCR0RB/S-ICBOSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71

PAGE 14

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



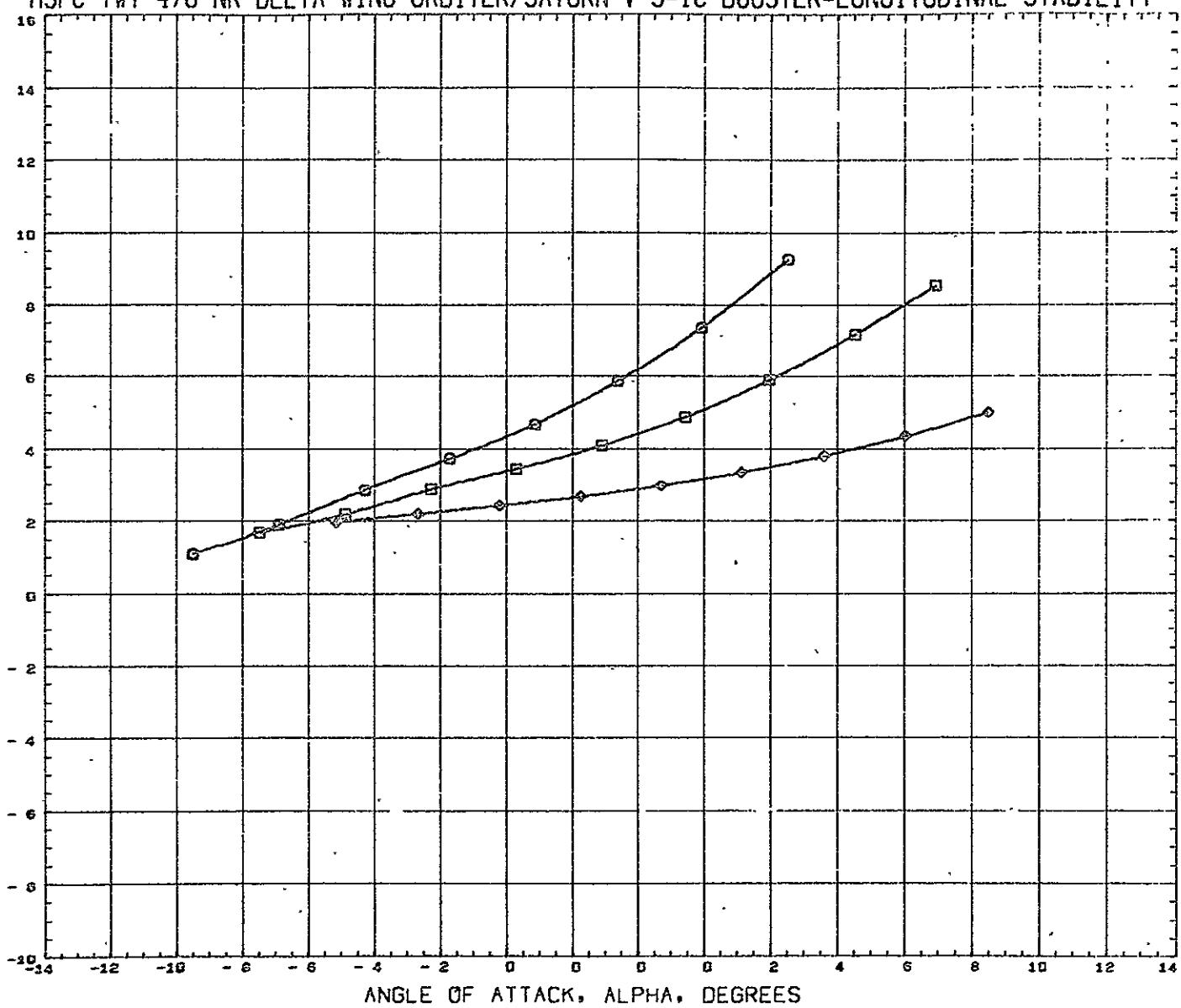
SYMBOL: MACH PARAMETRIC VALUES
 ○ 0.599 BETA - 0.020 ORBINC 4.000
 □ 0.895
 ◇ 0.993
 △ 1.098

DATA HIST. CODE HH

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V-S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



ANGLE OF ATTACK, ALPHA, DEGREES

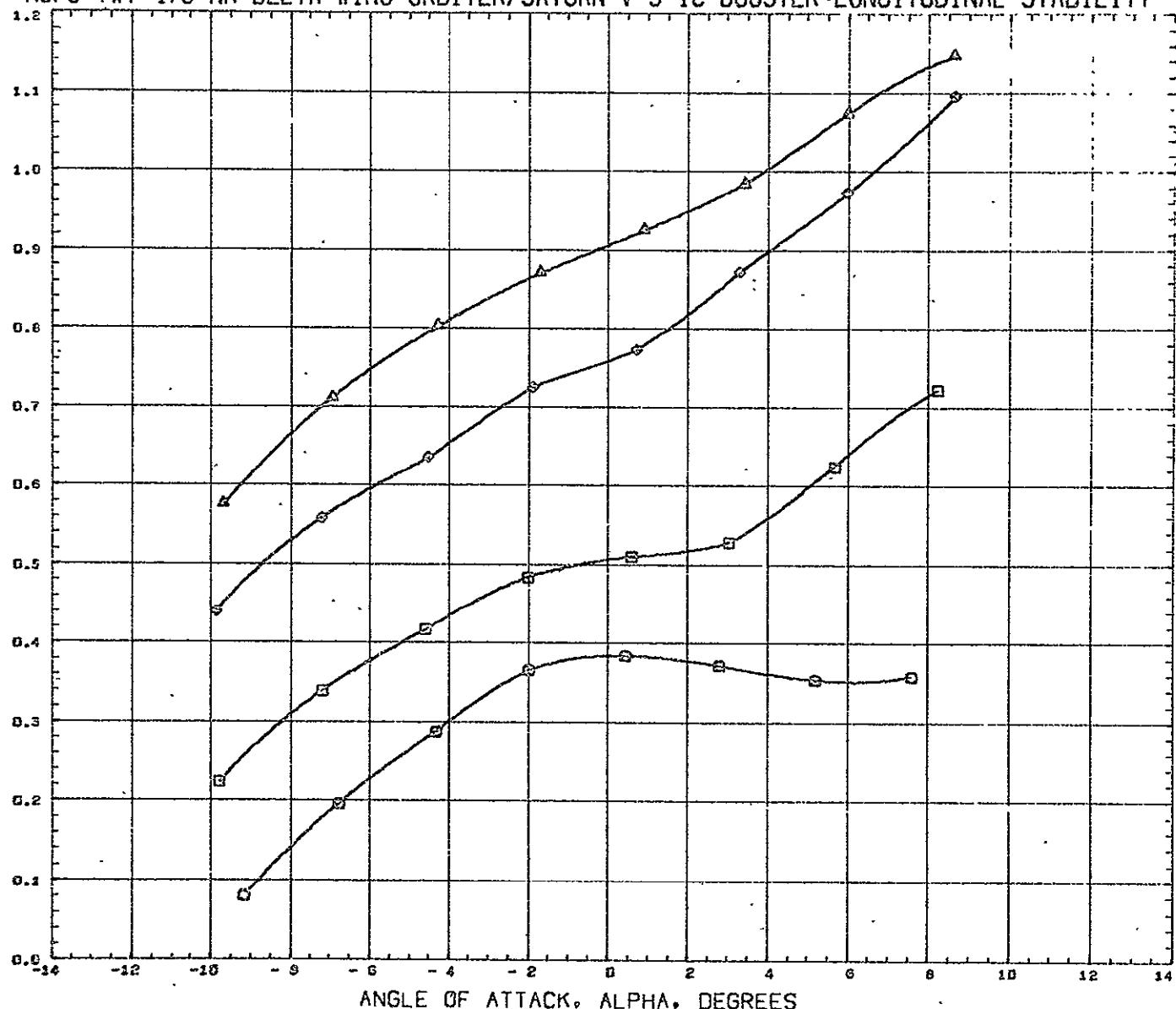
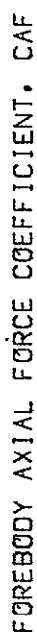
SYMBOL MACH PARAMETRIC VALUES
 □ 1.200 BETA - 0.020 ORBINC 4.000
 □ 1.454
 ◆ 1.953

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034.

DATA HIST. CODE MM

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 16

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



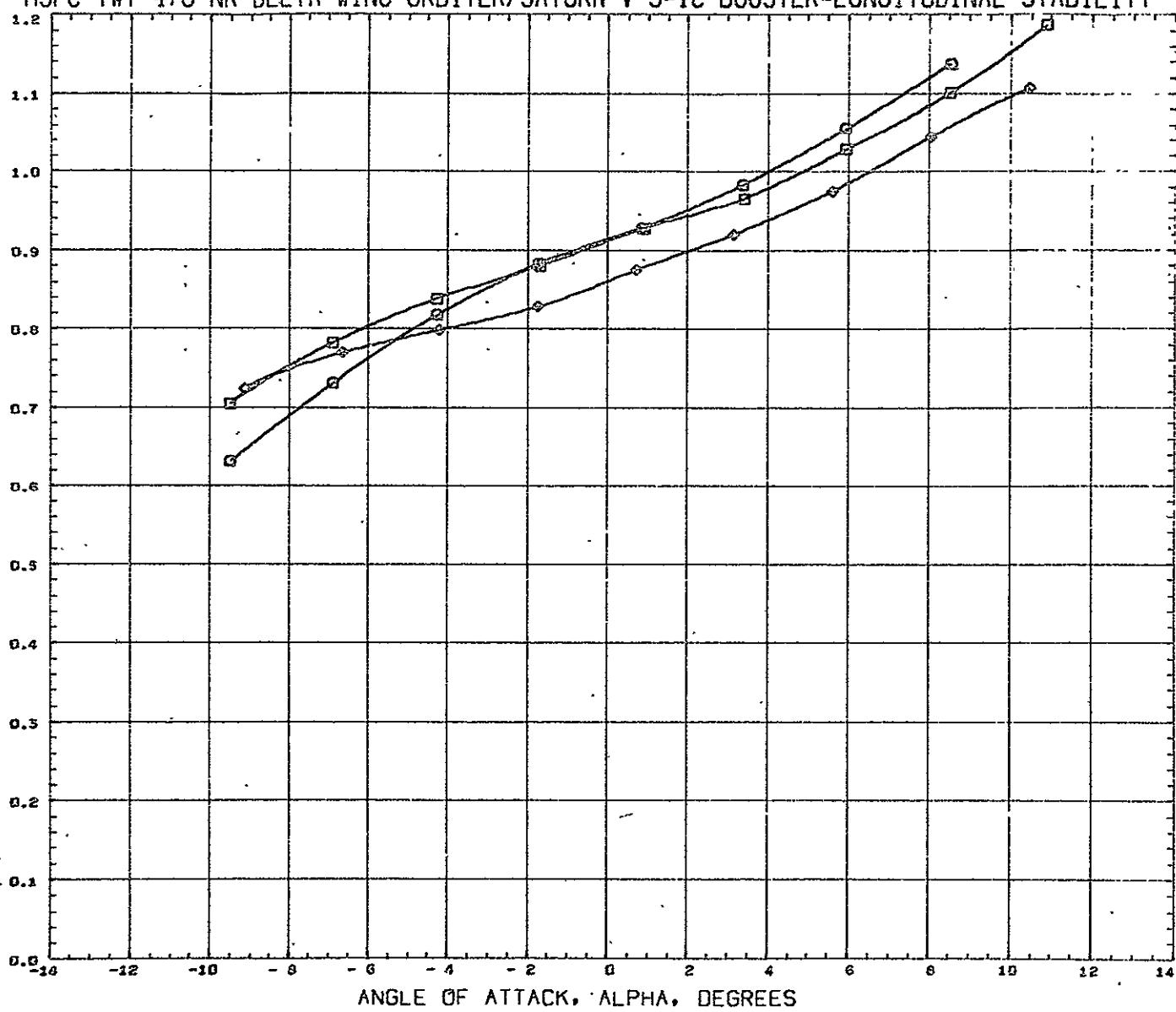
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
○	0.599		0.020	4.000
□	0.895			
◊	0.993			
△	1.098			

DATA MIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES

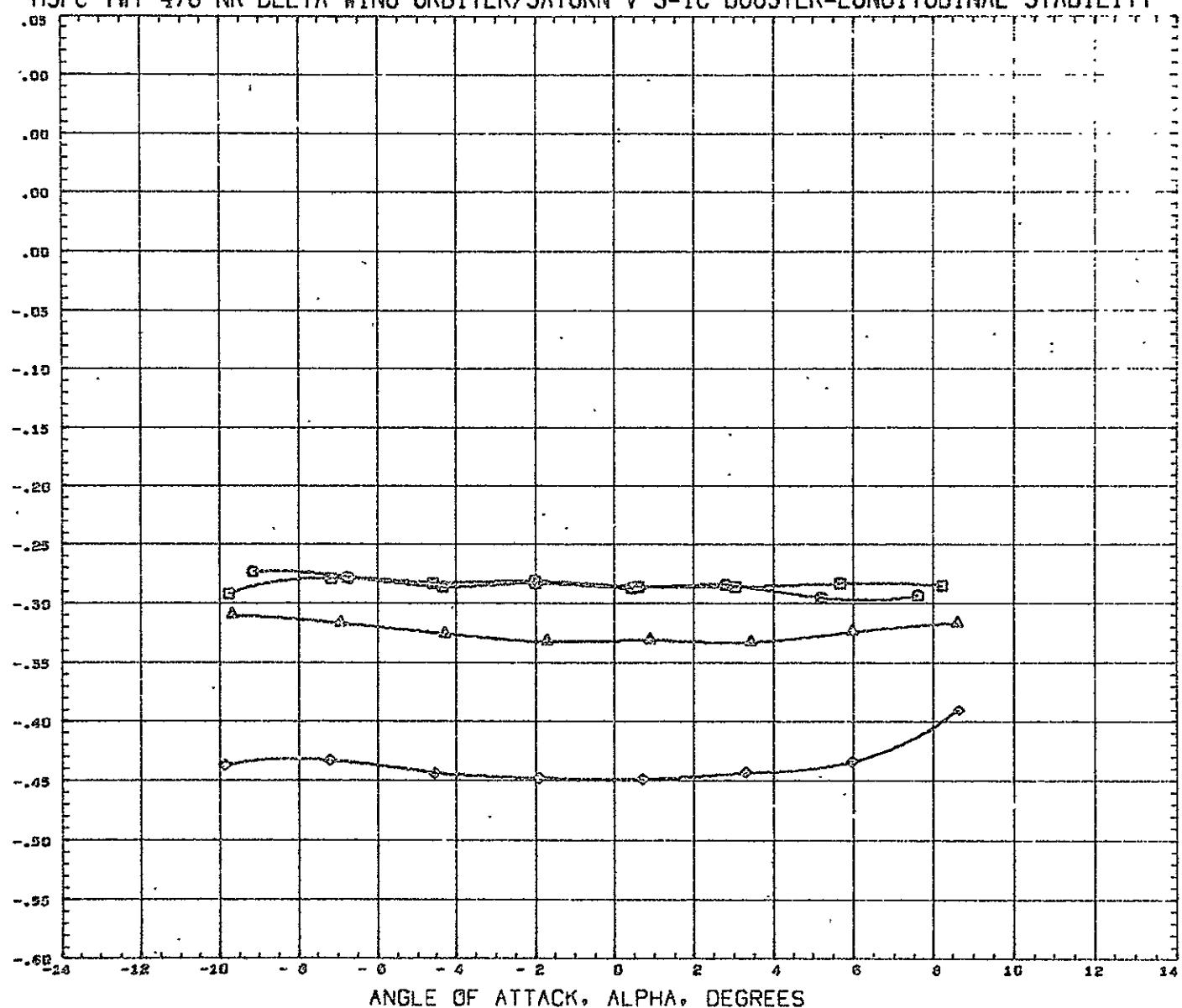
SYMBOL MACH PARAMETRIC VALUES
 ○ 1.200 BETA - 0.020 ORBINC 4.000
 □ 1.454
 ◇ 1.953

DATA HIST. CODE MH

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 18

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

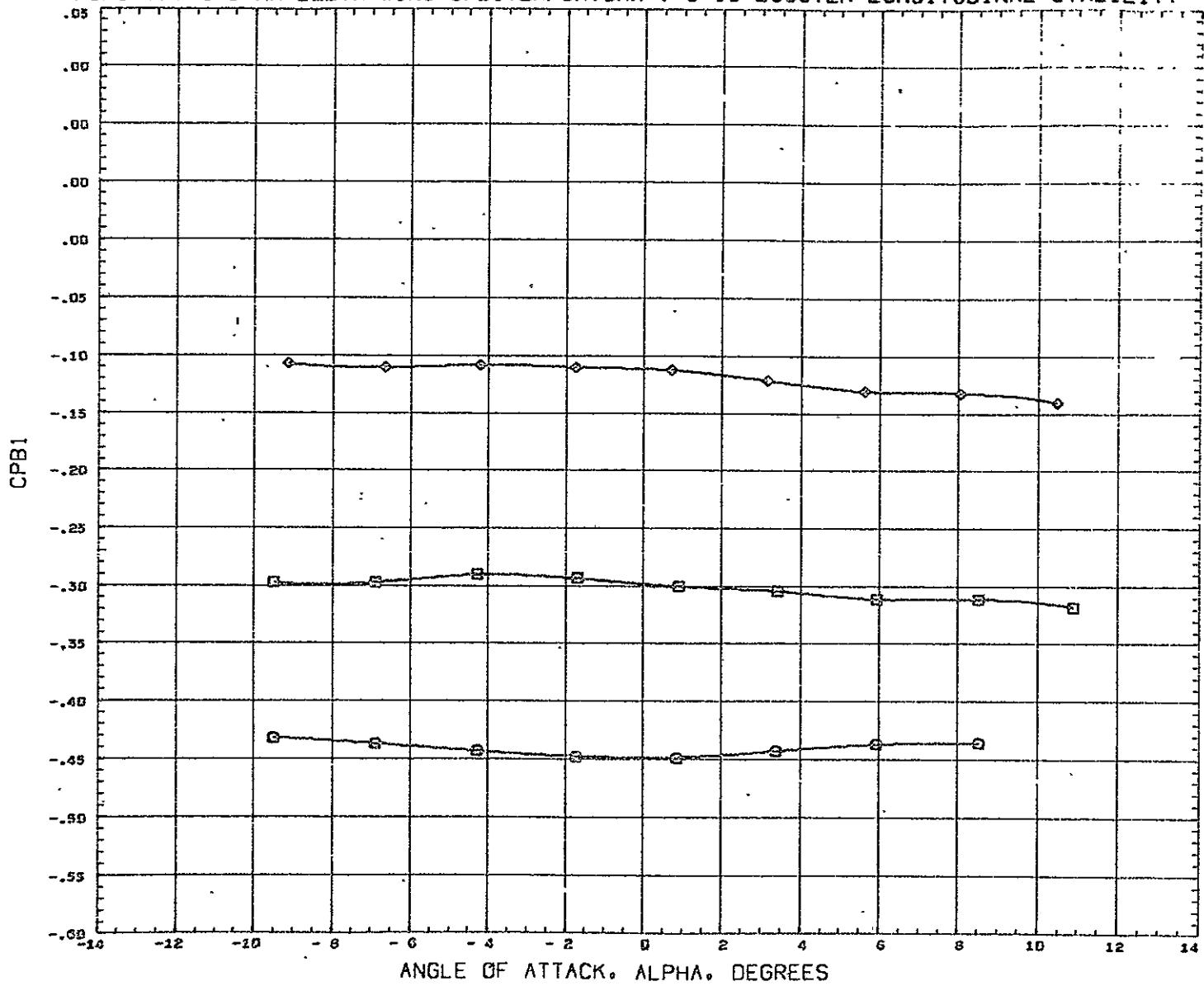


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
O	0.599		0.020	4.000
D	0.685			
D	0.993			
A	1.996			

DATA HIST. CODE MM

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
MRP	0.0330	INCHES
CALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



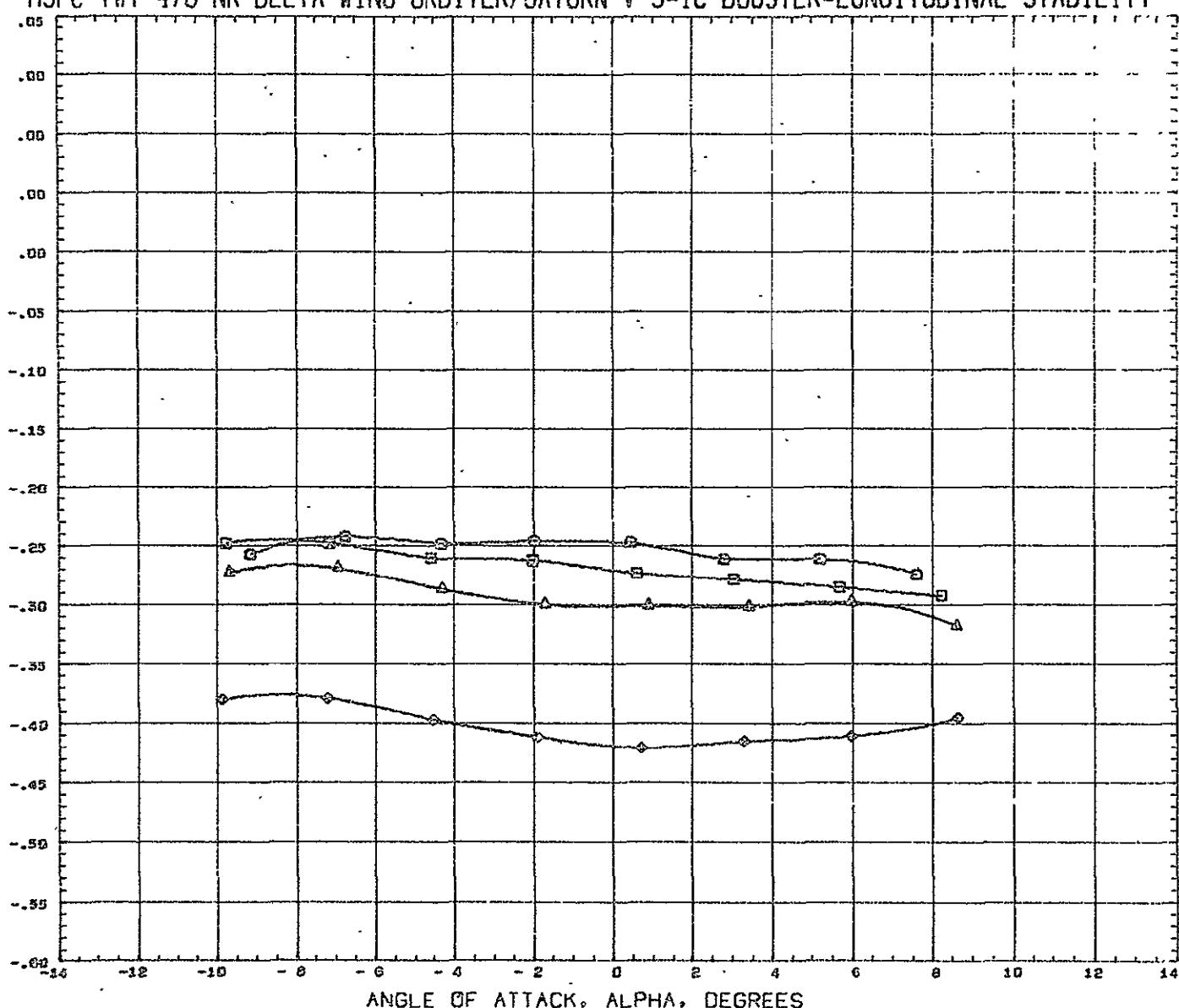
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
□	1.200		-0.020	4.000
□	1.454			
◊	1.953			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
MRF	0.0000	INCHES
HRF	0.0330	INCHES
CAFE	0.0000	

DATA HIST. CODE MH

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 20

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

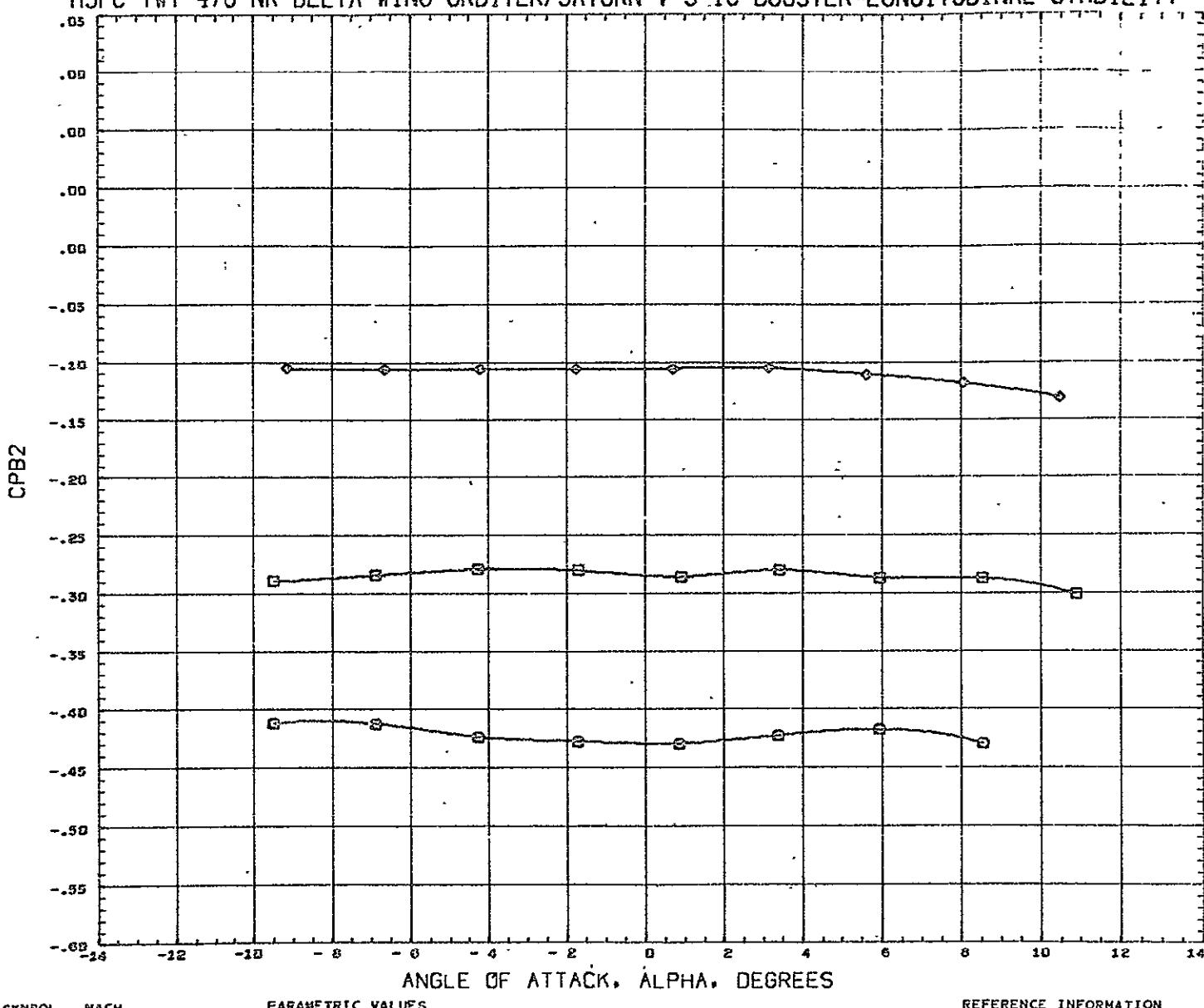


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
\square	0.998		- 0.020	4.000
\square	0.893			
\diamond	0.993			
Δ	1.098			

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

DATA MIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



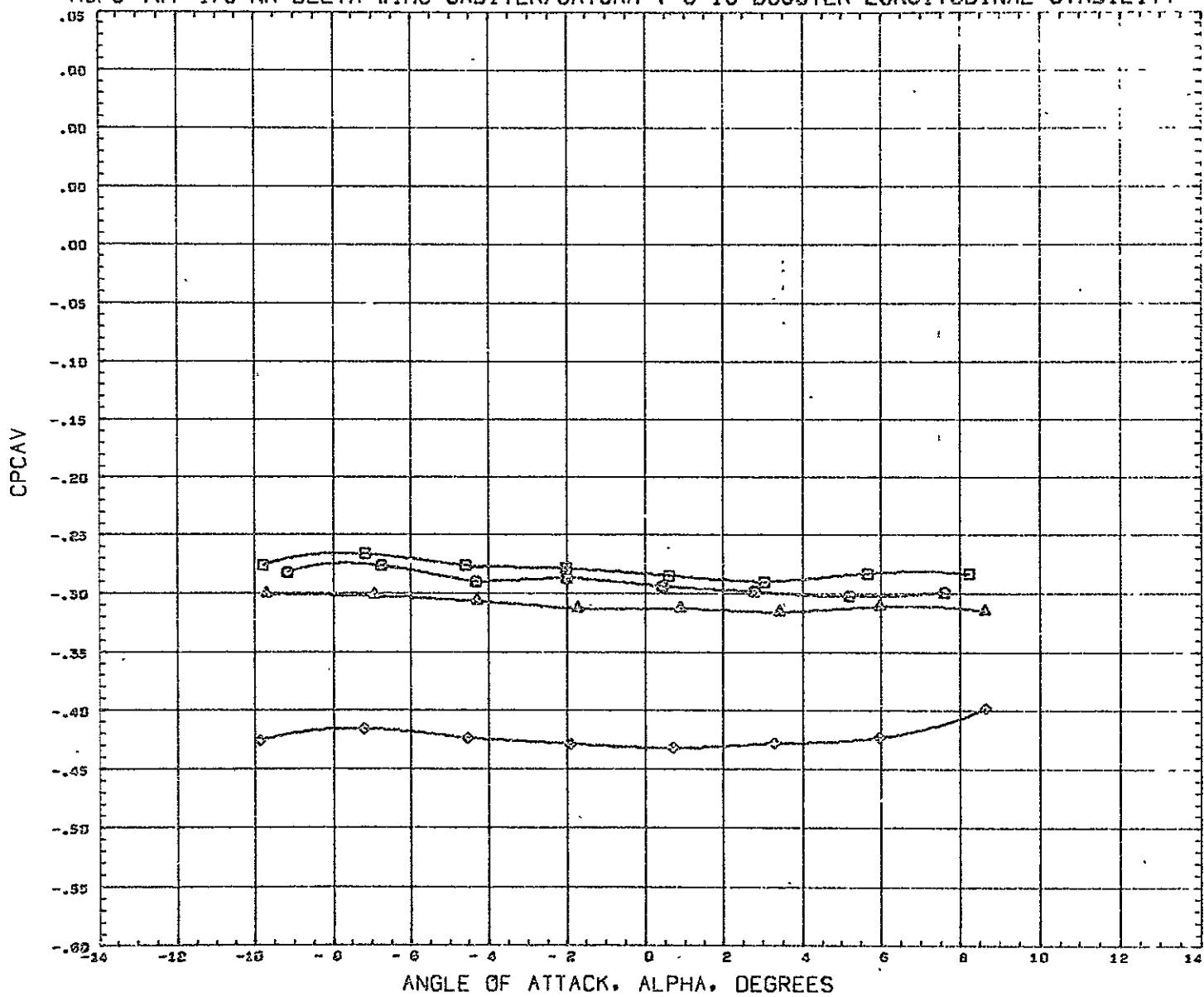
SYMBOL	NAME	PARAMETRIC VALUES		
		BETA	-D.020	ORBINC
□	1.200			4.000
□	1.454			
◊	1.953			

REFERENCE INFORMATION		
REFS.	1.3960	SQ. IN.
REFL.	1.3330	INCHES
REFB.	1.3330	INCHES
XHXR	5.2640	INCHES
YHXR	0.0000	INCHES
ZHXR	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSEC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 22

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

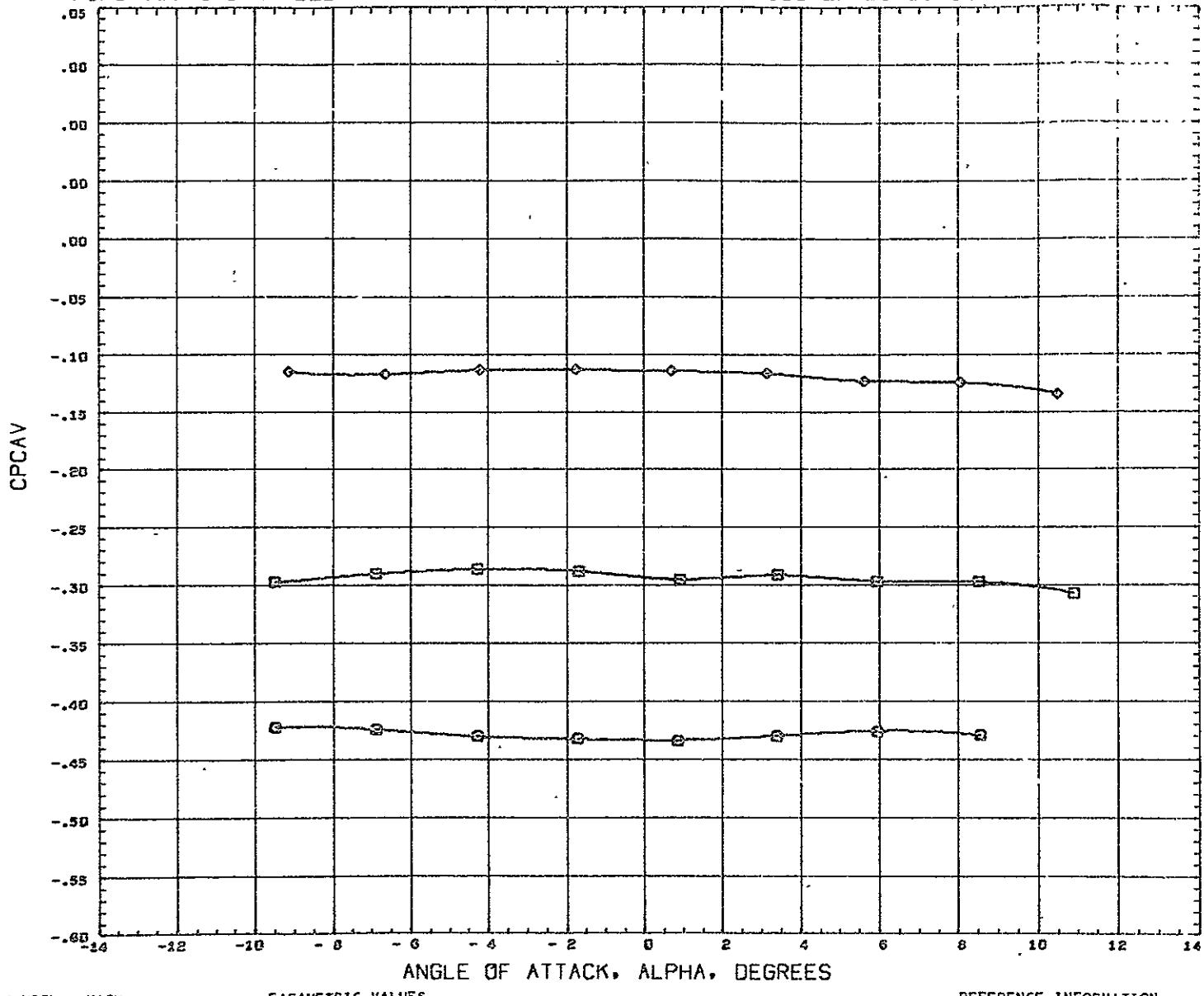


SYMBOL	H4CH	PARAMETRIC VALUES
□	0.599	BETA - 0.020
□	0.895	ORBINC 4.000
◊	0.993	
△	1.698	

DATA MIST. CODE HH

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



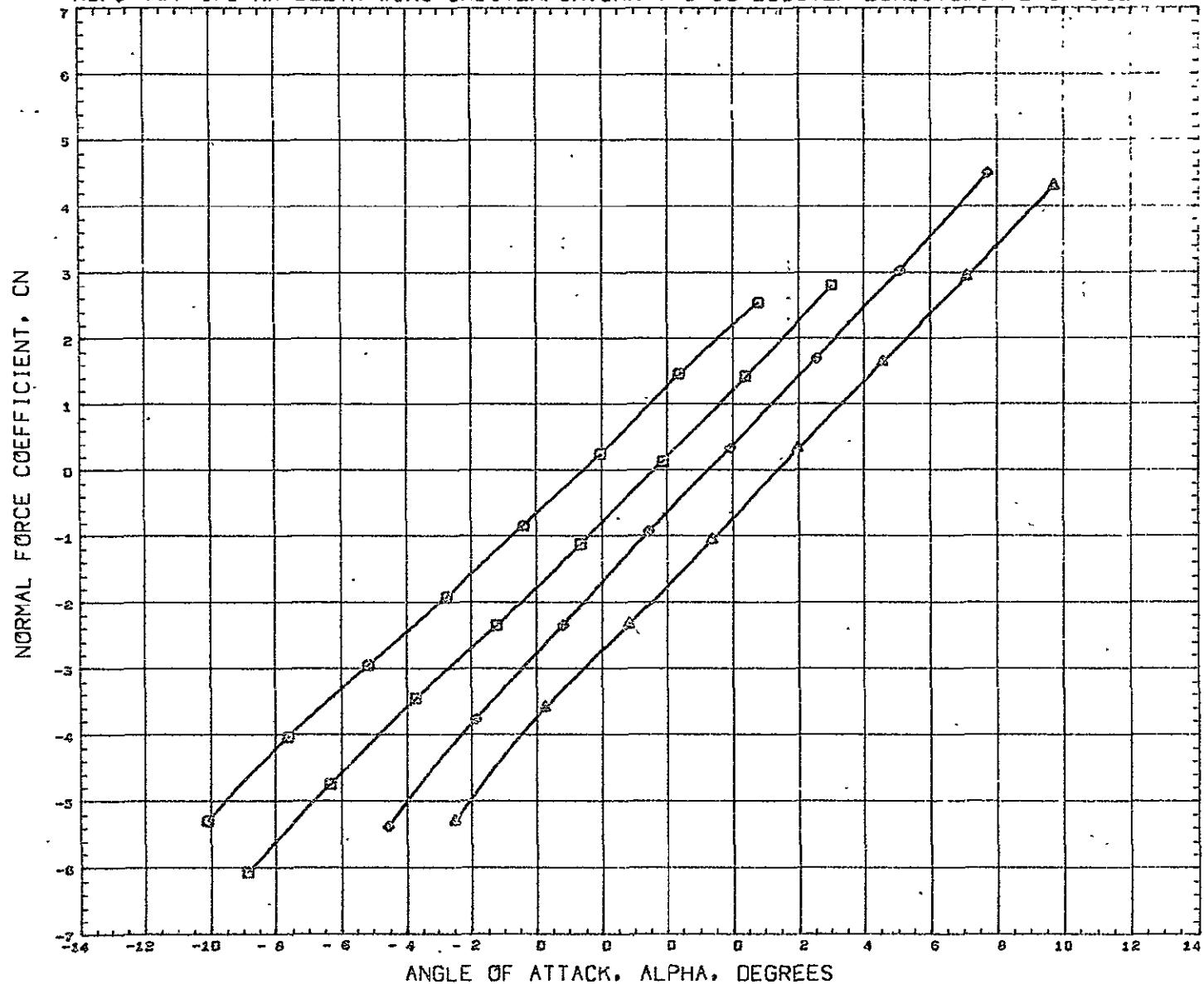
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	- 0.028	ORBIMC
○	1.200			4.000
□	1.454			
◊	1.953			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRP	0.0000	INCHES
HRF	0.0350	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 24

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



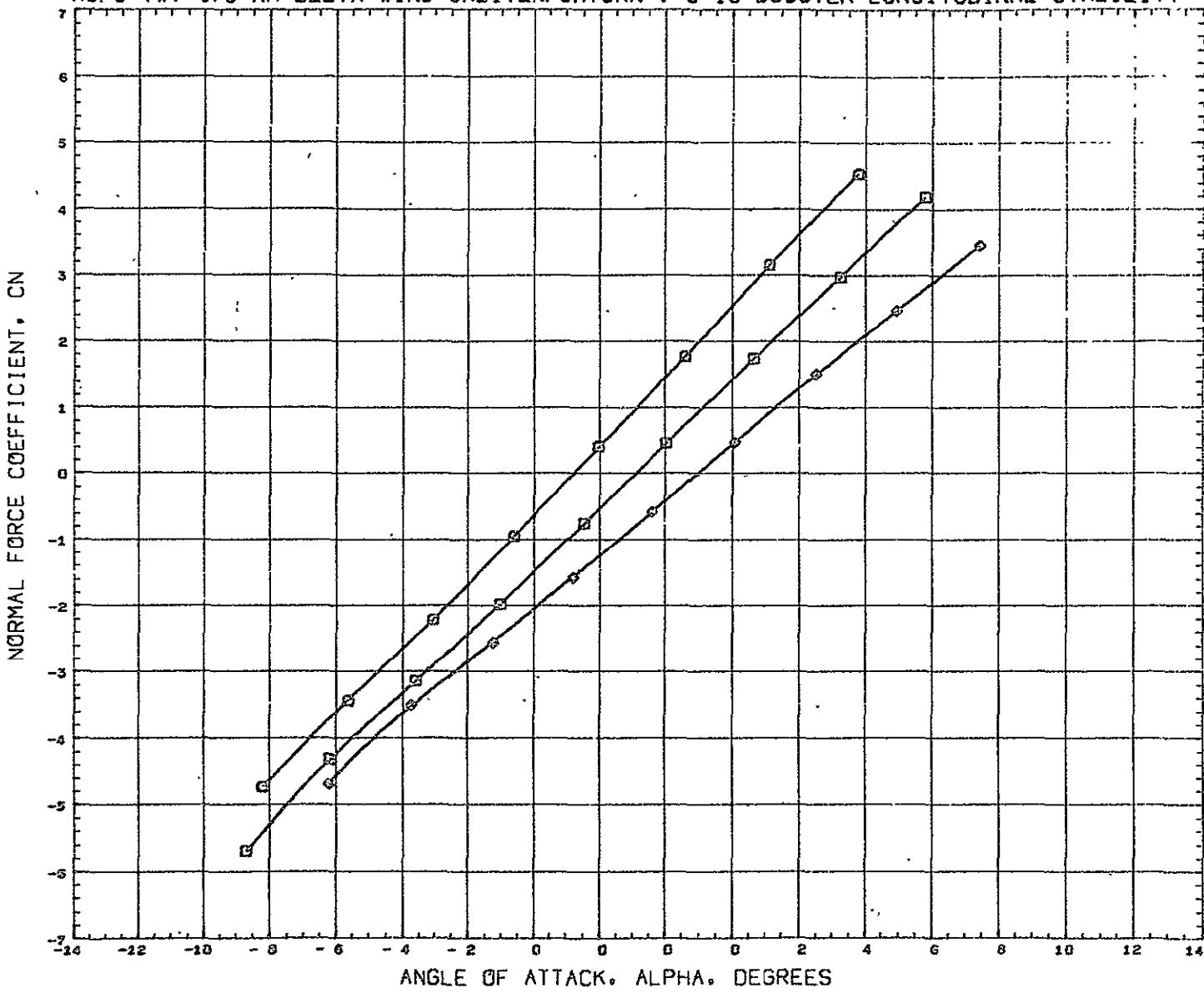
SYMBOL	MACH	BETA	PARAMETRIC VALUES		
\circ	0.599		0.010	ORBINC	- 2.000
\square	0.697				
\diamond	0.994				
Δ	1.091				

DATA MIST, CODE MM

REFERENCE INFORMATION		
CFS	1.3960	SQ.IN.
CFL	1.3330	INCHES
CFB	1.3330	INCHES
CRP	5.2640	INCHES
CRP	0.0000	INCHES
CRP	0.0330	INCHES
CALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 255

NSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES		
○	1.195		0.810	ORBINC	- 2.000
□	1.462				
◊	1.955				

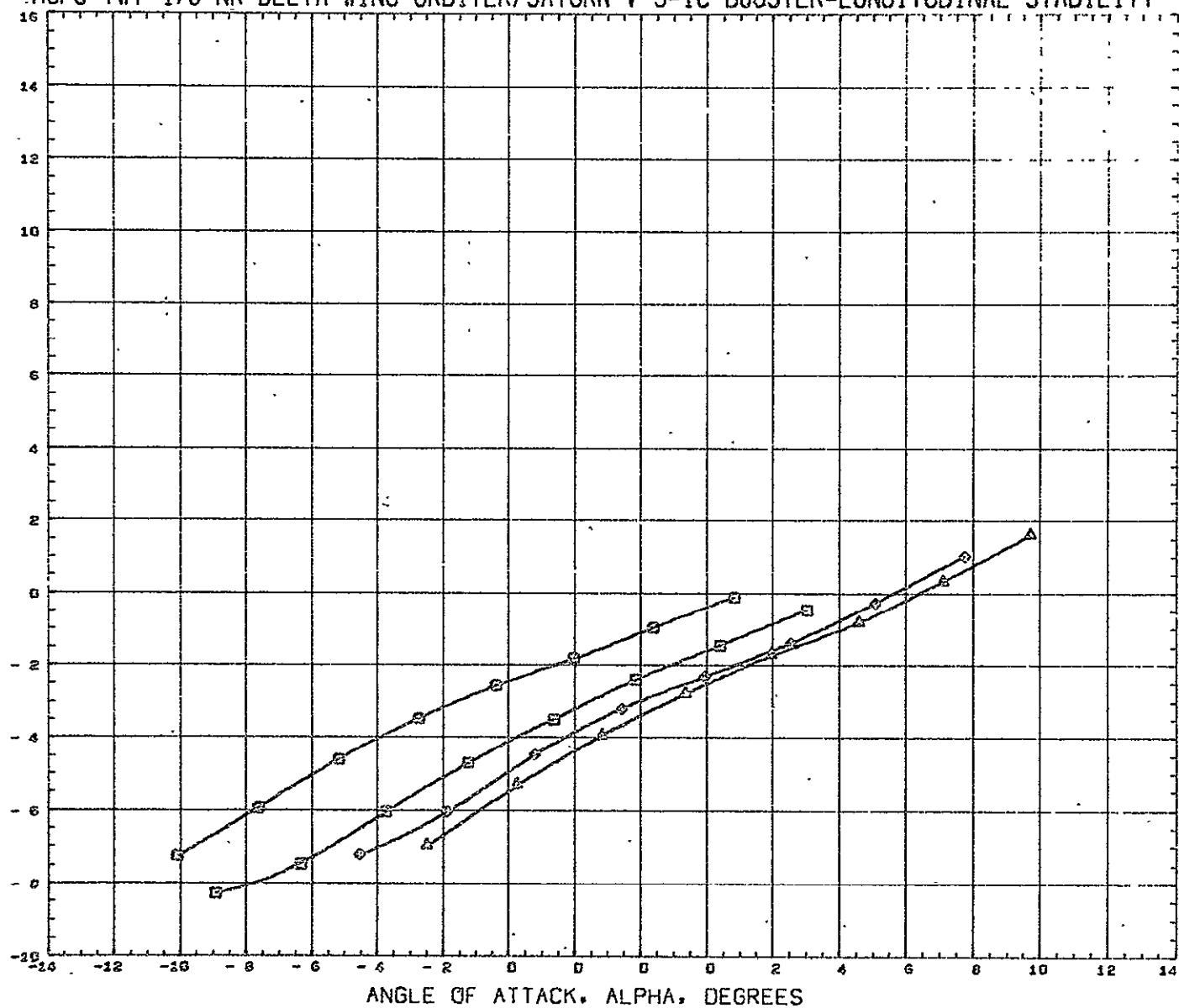
REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER .BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 26

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

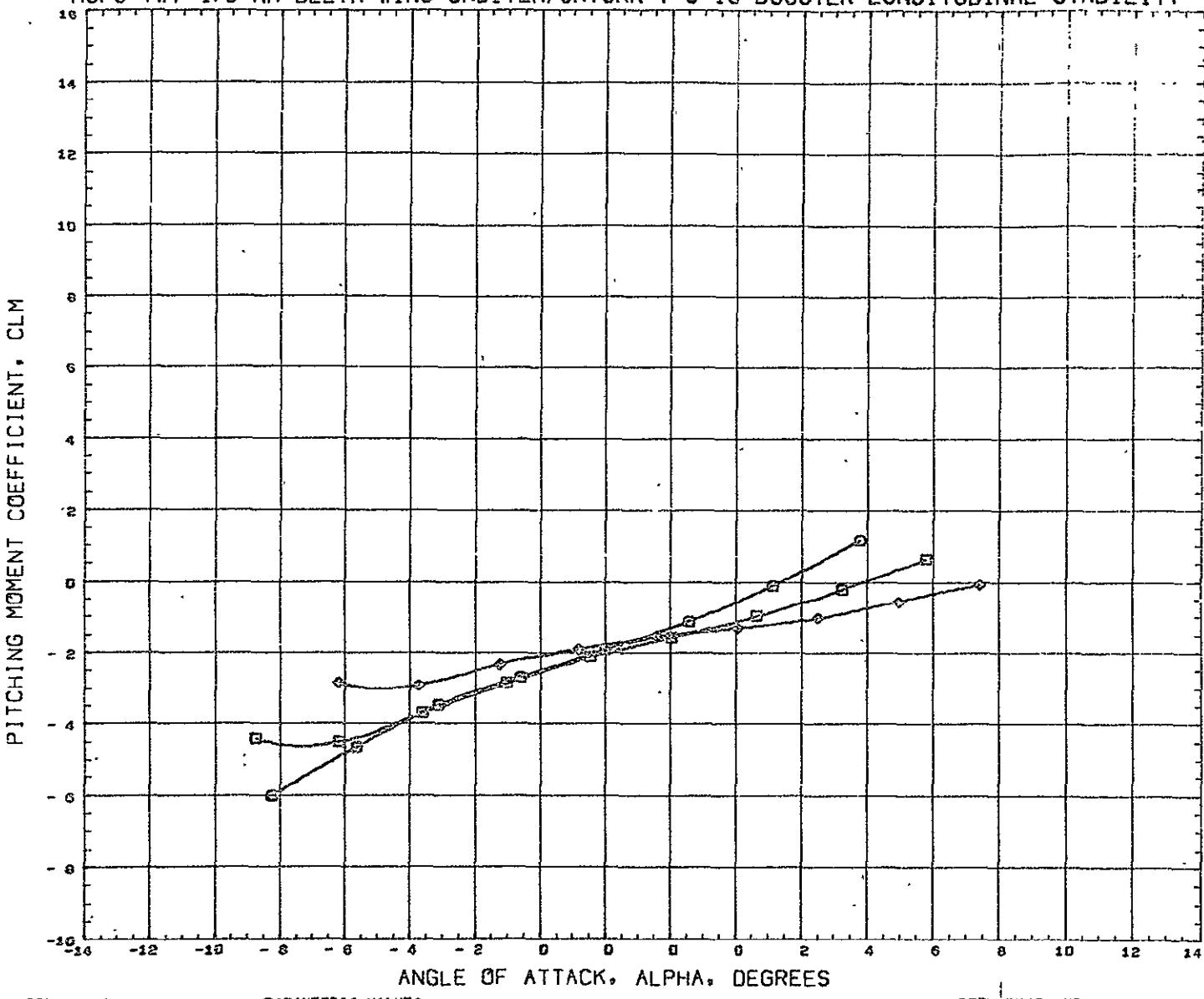
PITCHING MOMENT COEFFICIENT, CLM



SYMBOL	NACH	BETA	PARAMETRIC VALUES		REFERENCE INFORMATION		
			0.010	ORBINC = 2.000	REFS	1.3960	SG. IN.
□	0.599				REFL	1.3330	INCHES
□	0.897				REFB	1.3330	INCHES
○	0.994				XHRF	5.2640	INCHES
△	1.091				YHRF	0.0000	INCHES
					ZHRF	0.0330	INCHES
					SCALE	0.0034	

DATA MIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



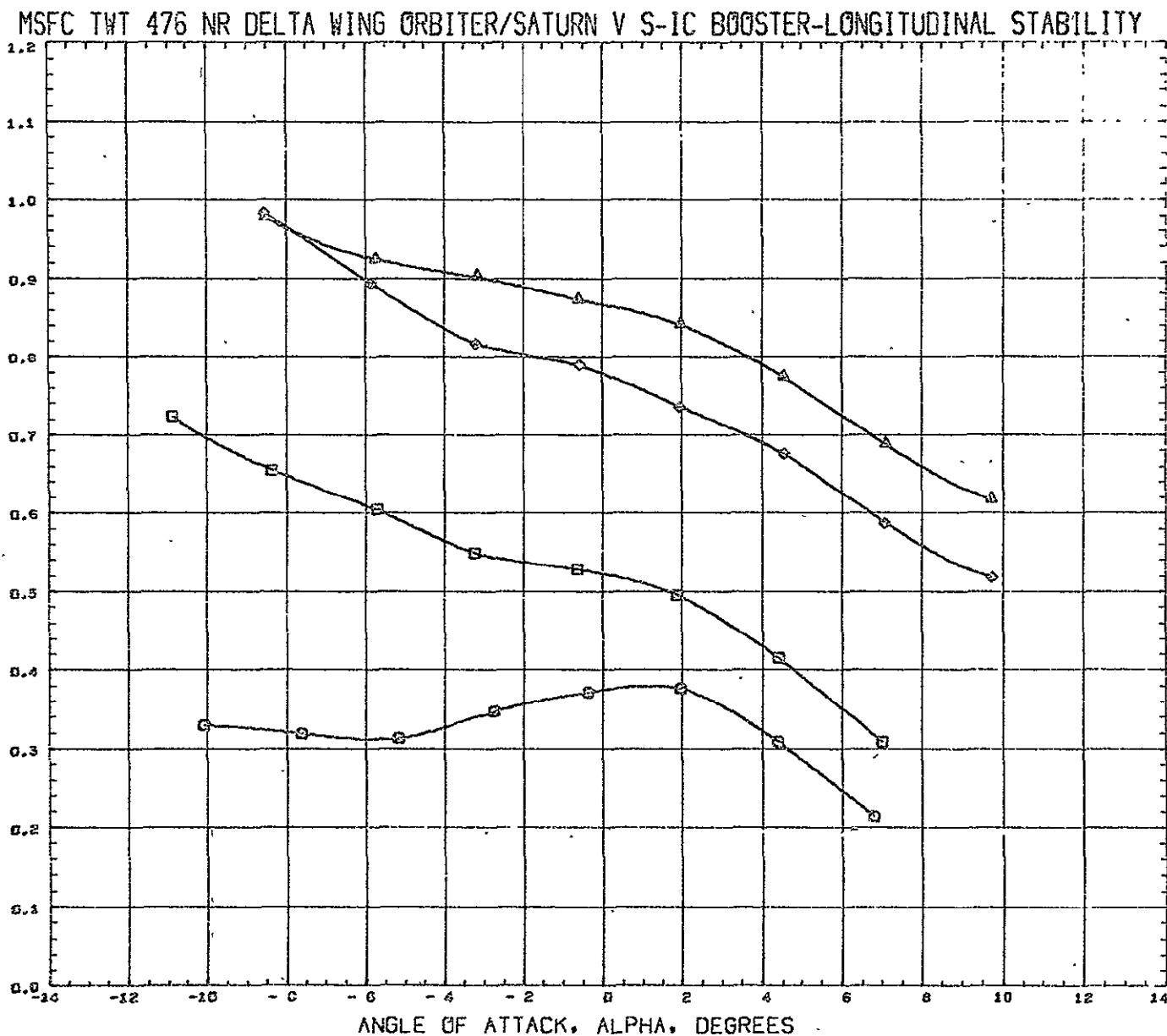
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<input type="checkbox"/>	1.462				
<input checked="" type="checkbox"/>	1.935				

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RP	5.2640	INCHES
RP	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	INCHES

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 28

FOREBODY AXIAL FORCE COEFFICIENT, CAF

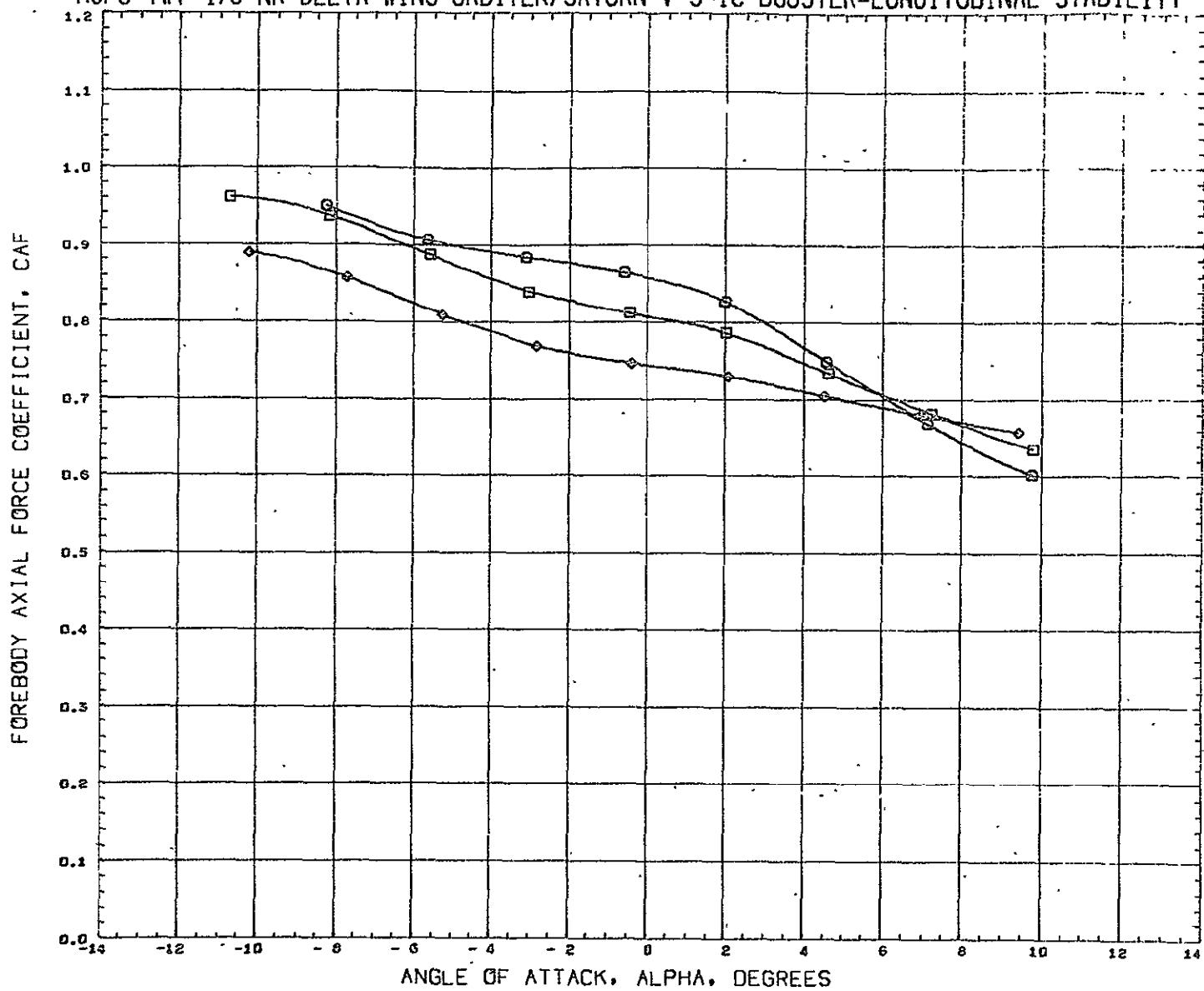


SYMBOL HACH PARAMETRIC VALUES
 ○ 0.599 BETA 0.010 ORBINC - 2.000
 □ 0.897
 ◇ 0.994
 △ 1.093

DATA HIST. CODE HH

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZMRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES		
□	1.195		0.010	ORBINC	- 2.000
□	1.462				
◊	1.955				

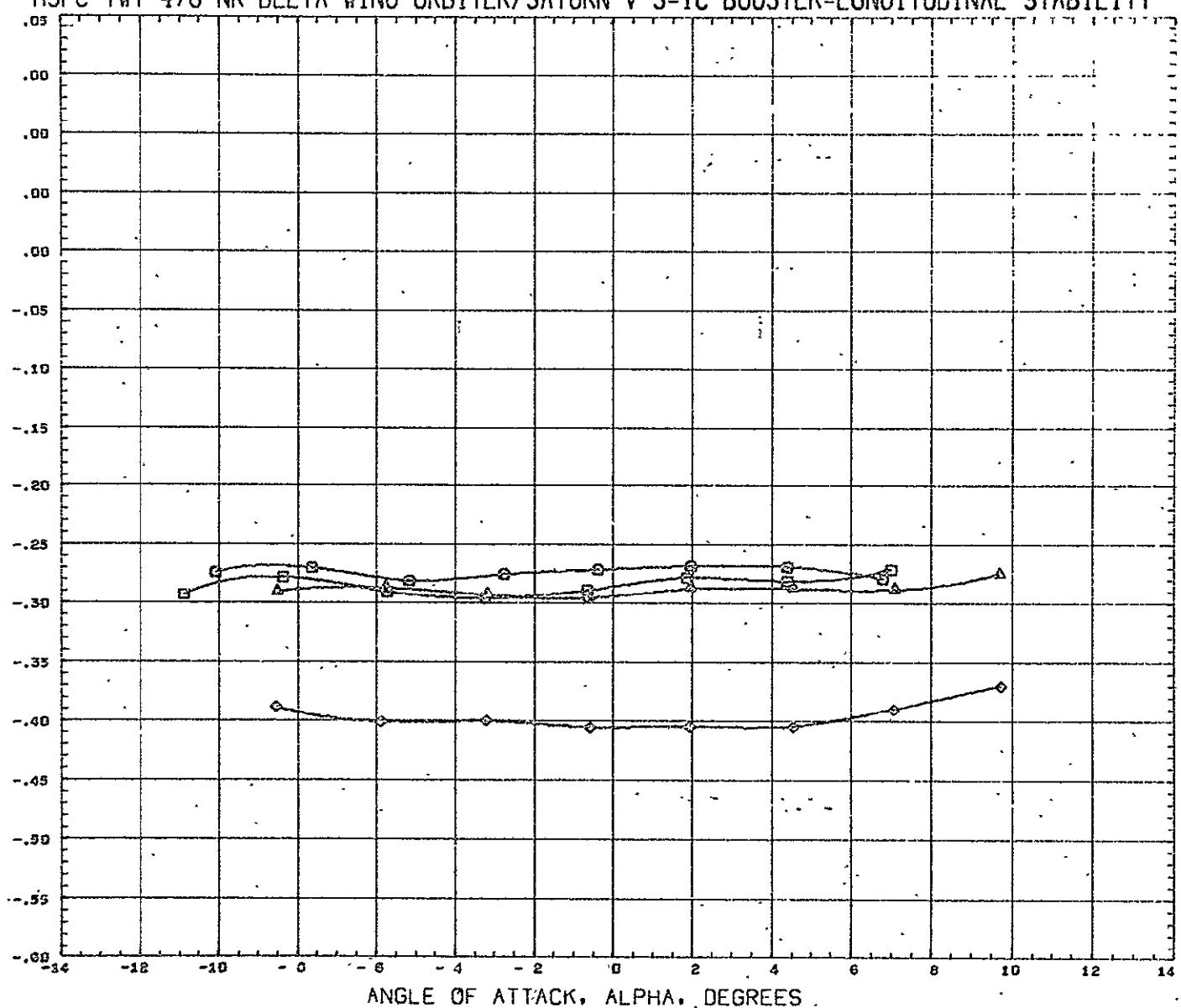
REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RP	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

DATA HIST. CODE NM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 30

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB1



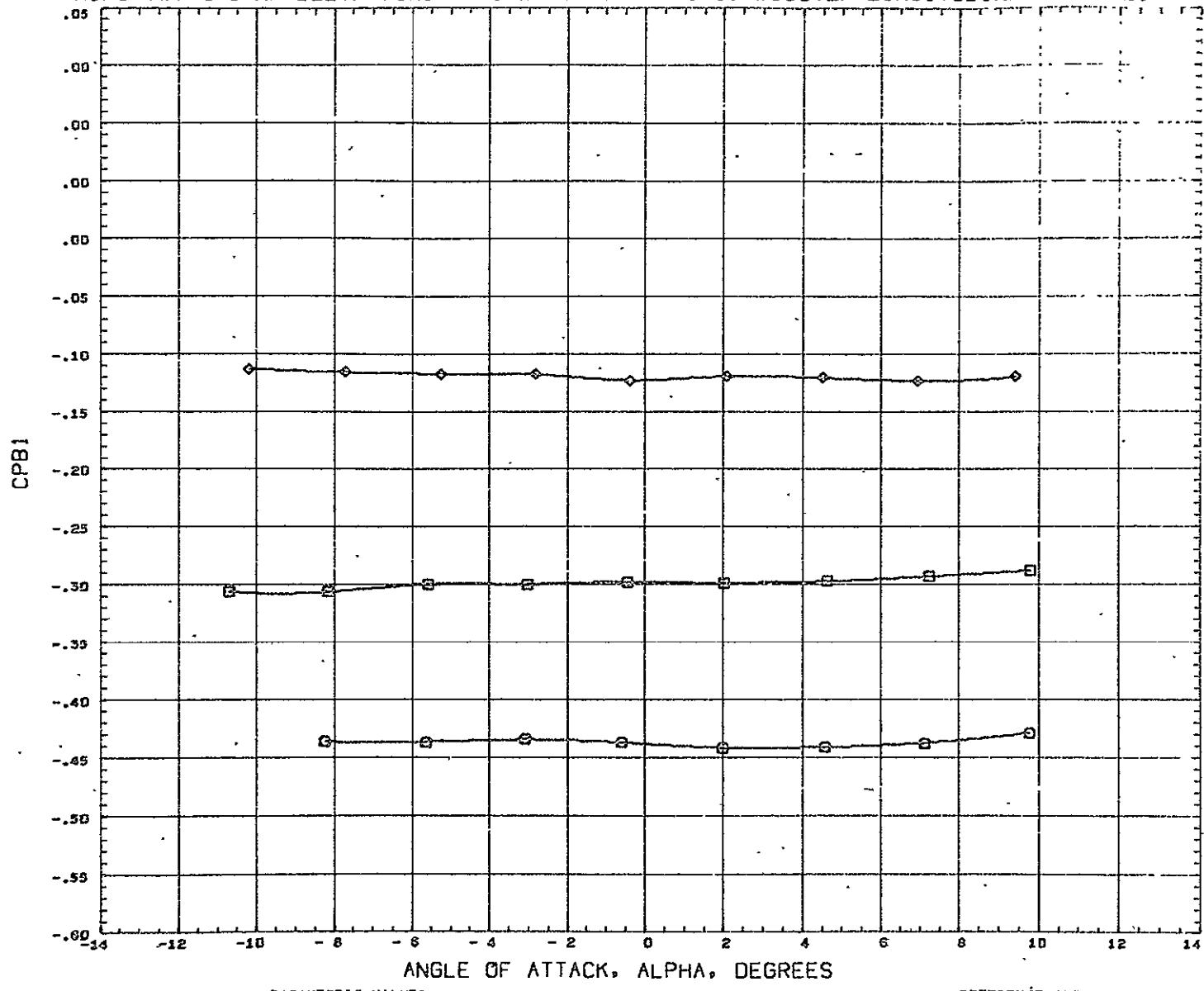
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL HACH PARAMETRIC VALUES
 ○ 0.599 BETA 0.010 ORBINC - 2.000
 □ 0.897
 ○ 0.994
 △ 1.091

DATA HIST. CODE MM

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V. S-IC BOOSTER-LONGITUDINAL STABILITY



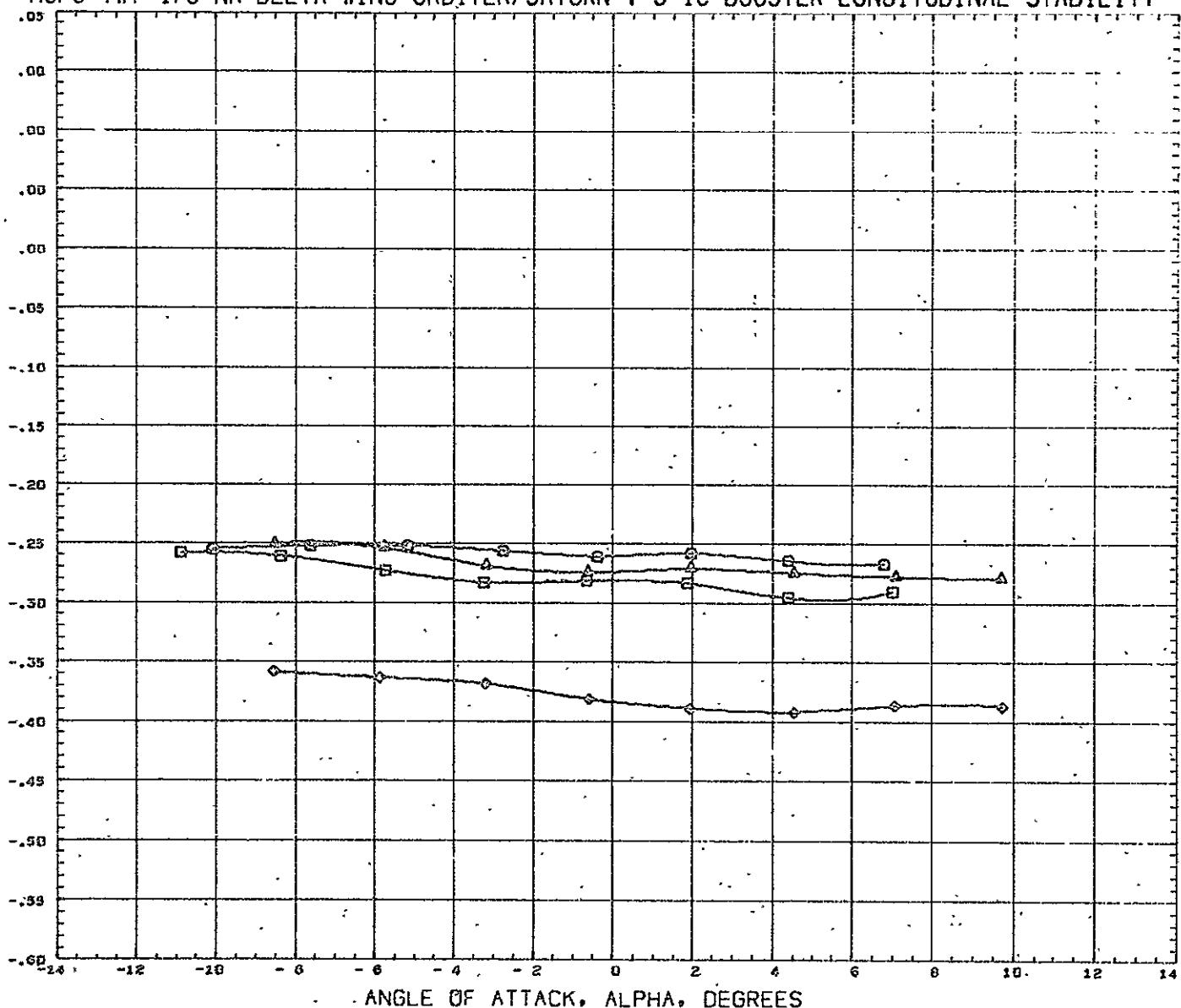
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC - 2.000
○	1.195			
□	1.462			
◊	1.955			

REFERENCE INFORMATION		
SFS	1.3960	SG.IN.
SFL	1.3330	INCHES
SFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE MM-

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 32

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

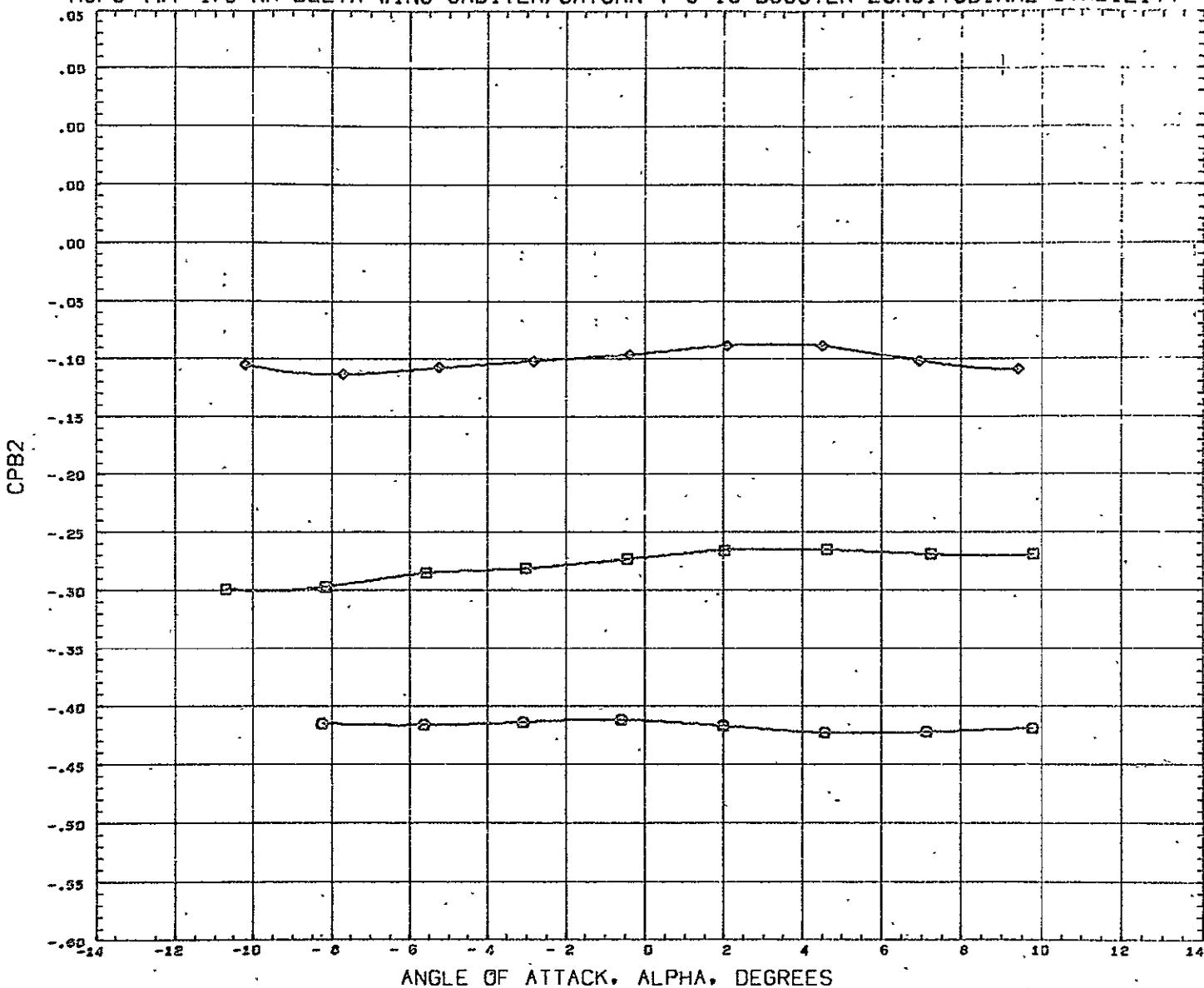


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.599		G.010 ORBINC - 2.000
□	0.697		
◊	0.994		
△	1.091		

DATA MIST, CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	-

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



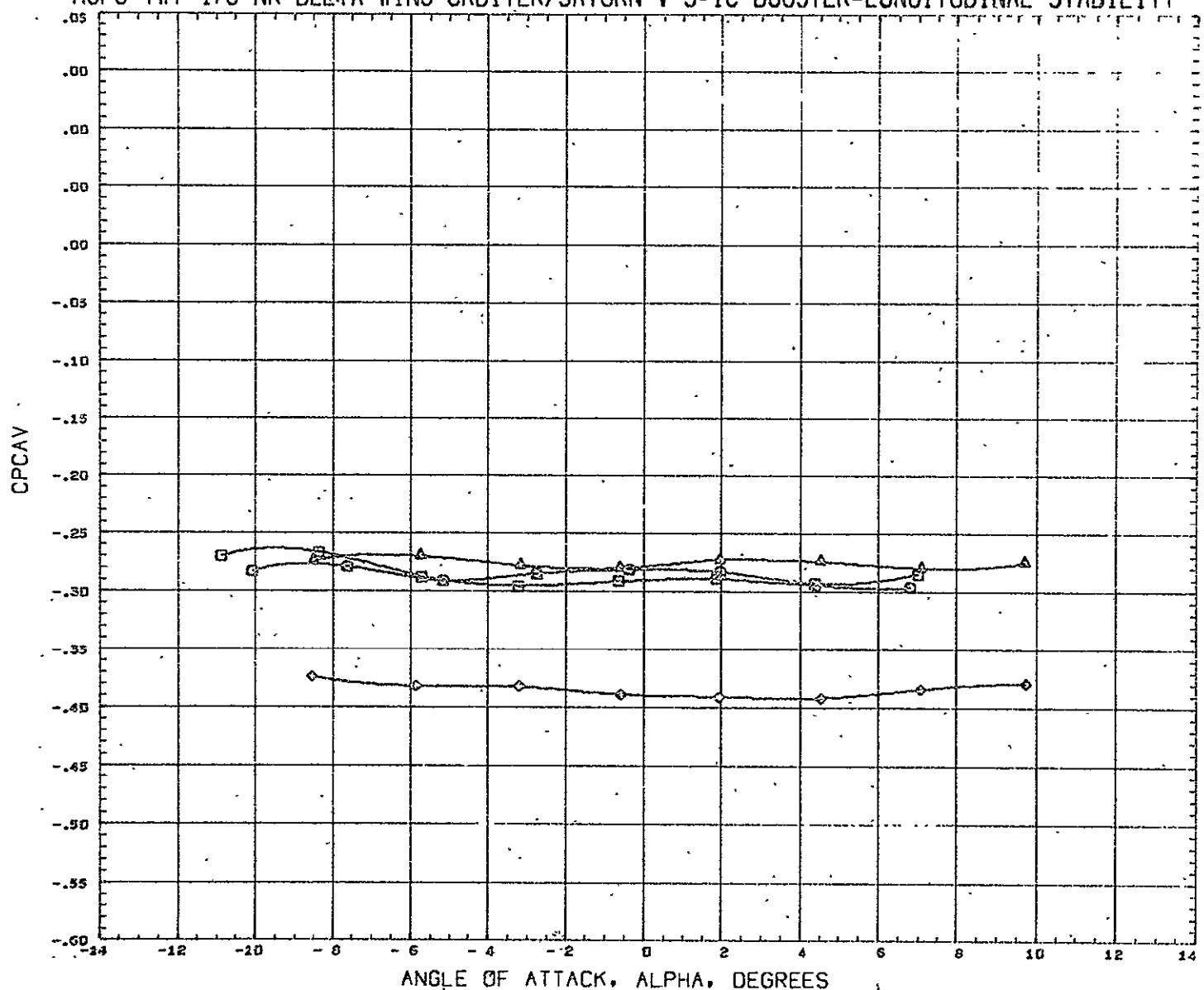
SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	1.195		0.010 - ORBINC = 2.000
□	1.462		
◊	1.955		

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HPR	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE . MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V1.7 (R25041) 14 JAN 71 PAGE 34

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

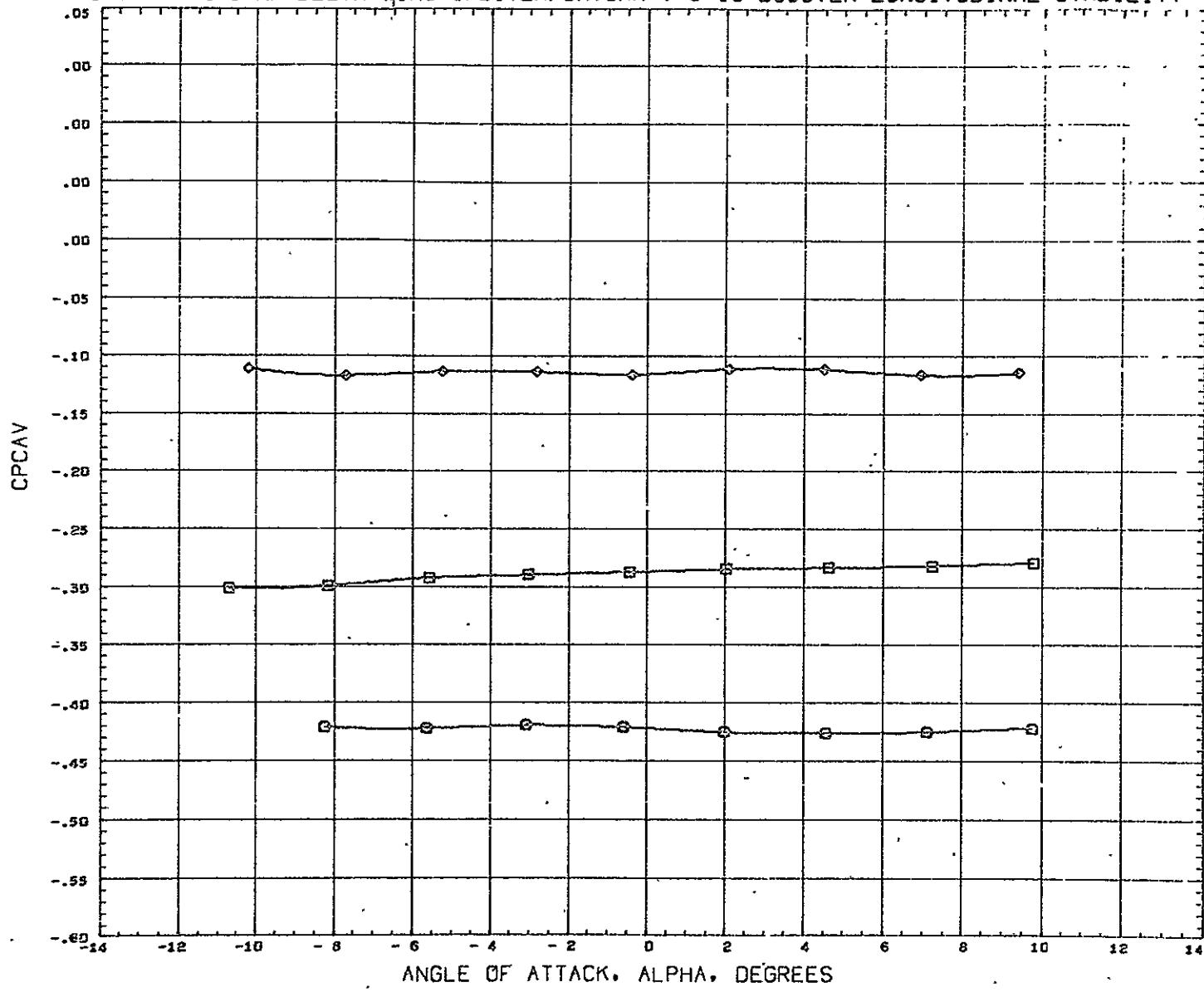


SYMBOL MACH		PARAMETRIC VALUES		
\circ	0.599	BETA	0.010	ORBINC - 2.000
\square	0.897			
\diamond	0.994			
Δ	1.091			

DATA HIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YMRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



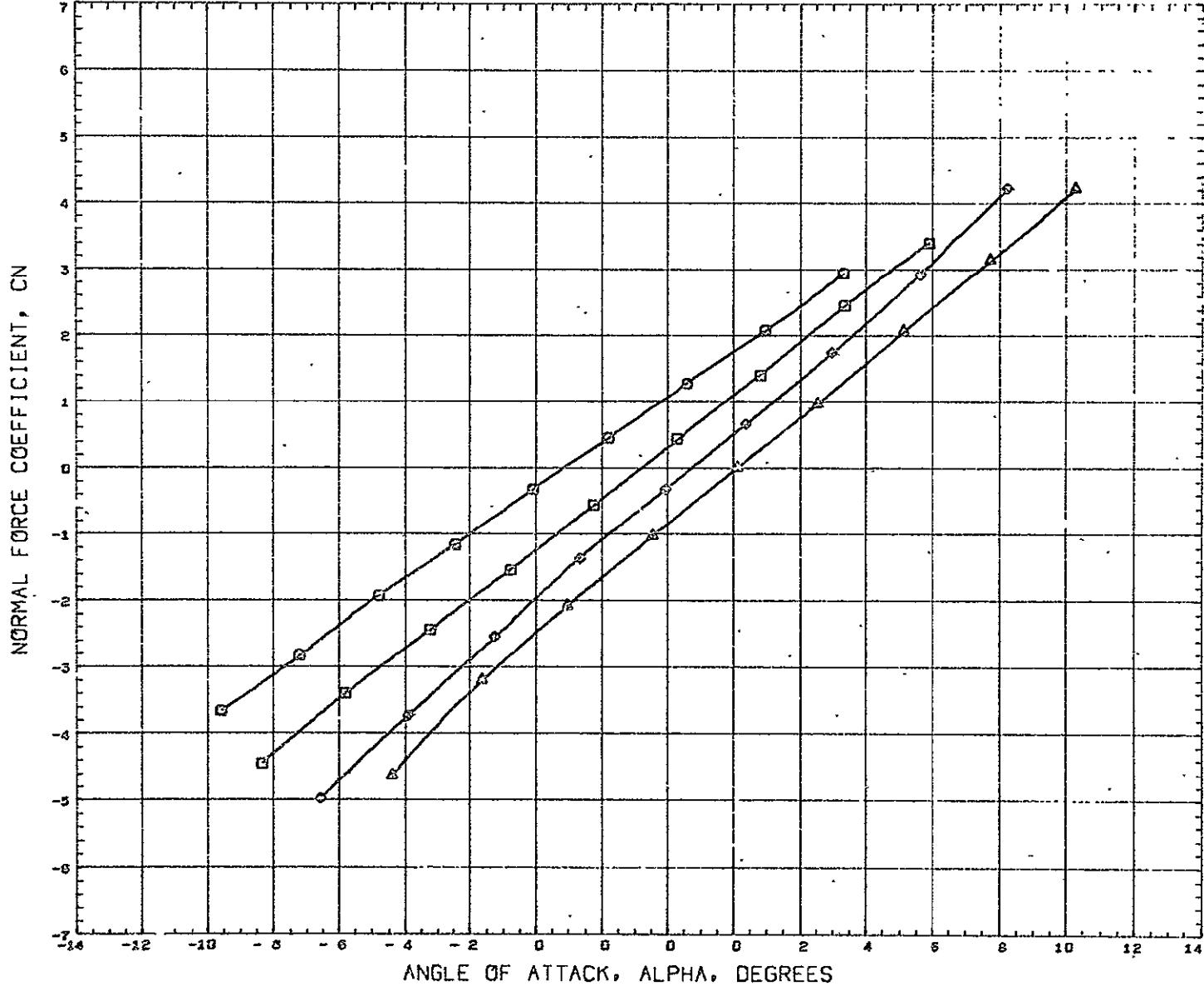
SYMBOL	HACH	PARAMETRIC VALUES
<input type="checkbox"/>	1.195	.BETA = 0.810
<input type="checkbox"/>	1.462	ORBINC = 2.000
<input checked="" type="checkbox"/>	1.955	

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
SFL	1.3330	INCHES
SFB	1.3330	INCHES
SRP	5.2640	INCHES
SRP	0.0000	INCHES
SRP	0.0330	INCHES
SALE	0.0034	INCHES

- DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 36

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

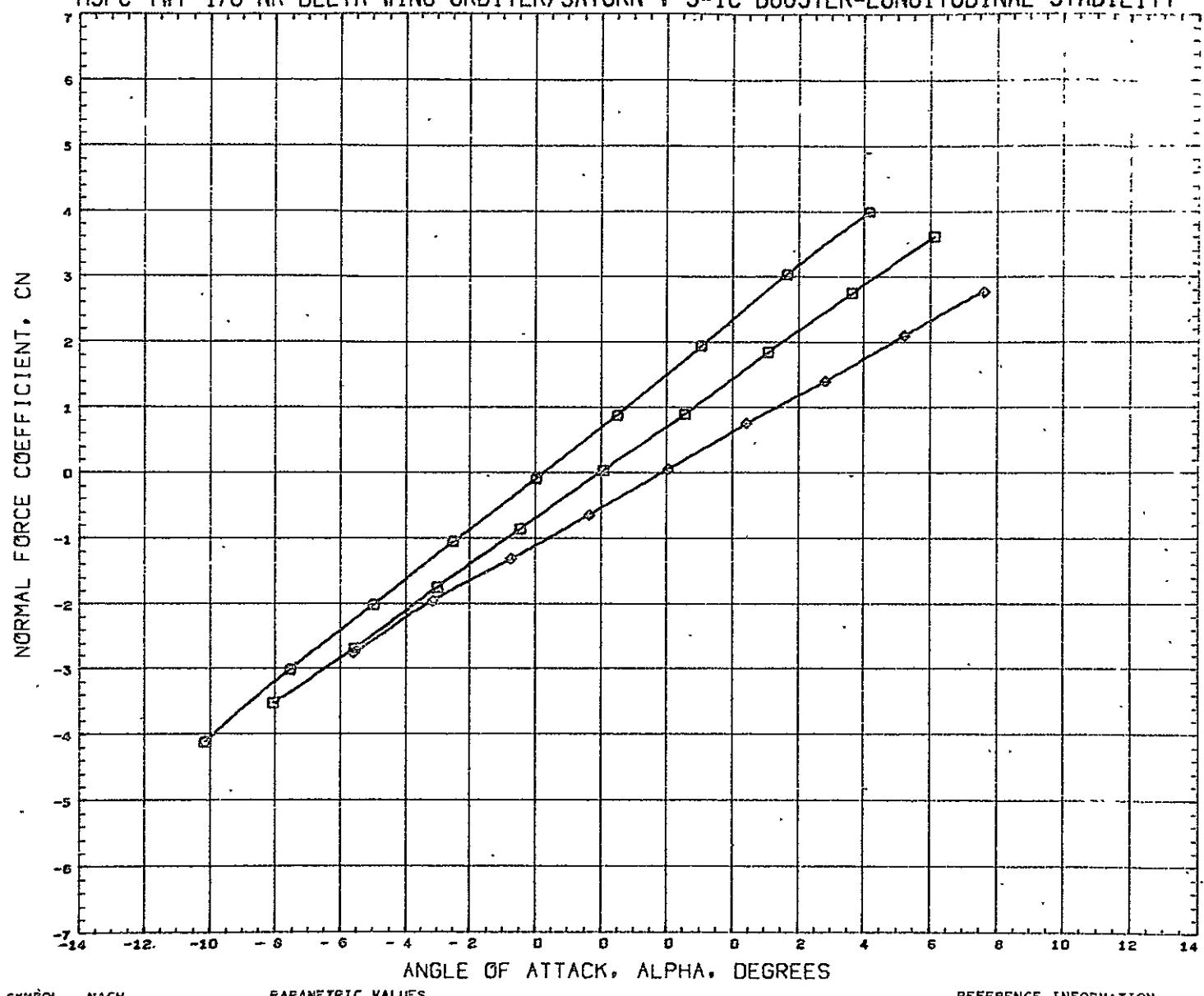


SYMBOL	PARAMETRIC VALUES		
	MACH	BETA	ORBINC
○	0.603	0.010	1.000
□	0.901		
◊	0.996		
△	1.103		

DATA MIST. CODE NN

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



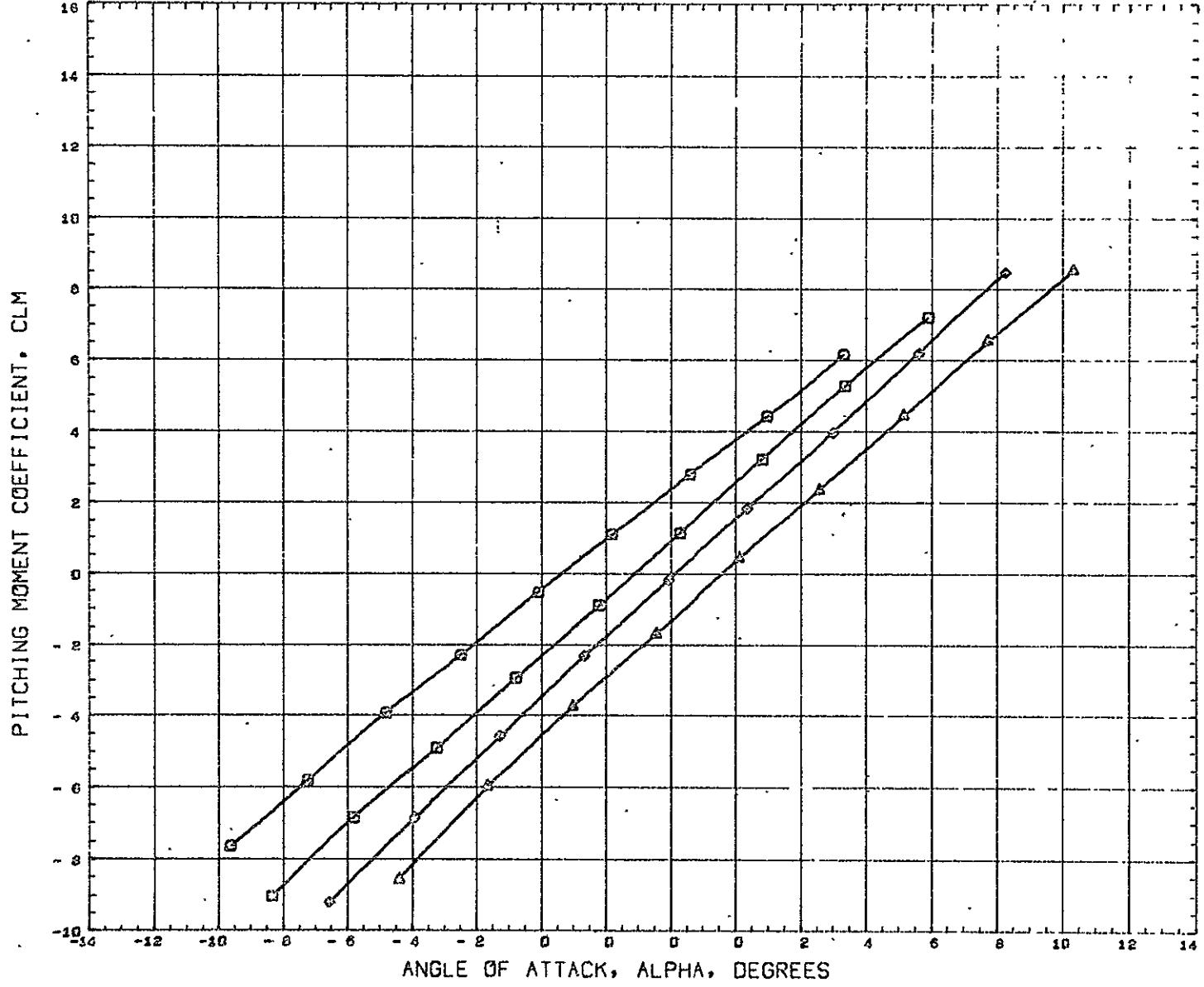
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.DID	ORBINC
□	1.196		0.010	1.000
□	1.467			
◊	1.965			

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
SFL	1.3330	INCHES
FB	1.3330	INCHES
HRP	5.2640	INCHES
HRF	0.0000	INCHES
IRF	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS-B5W14E3V17 (R25061) 08 JAN 71 PAGE 38

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

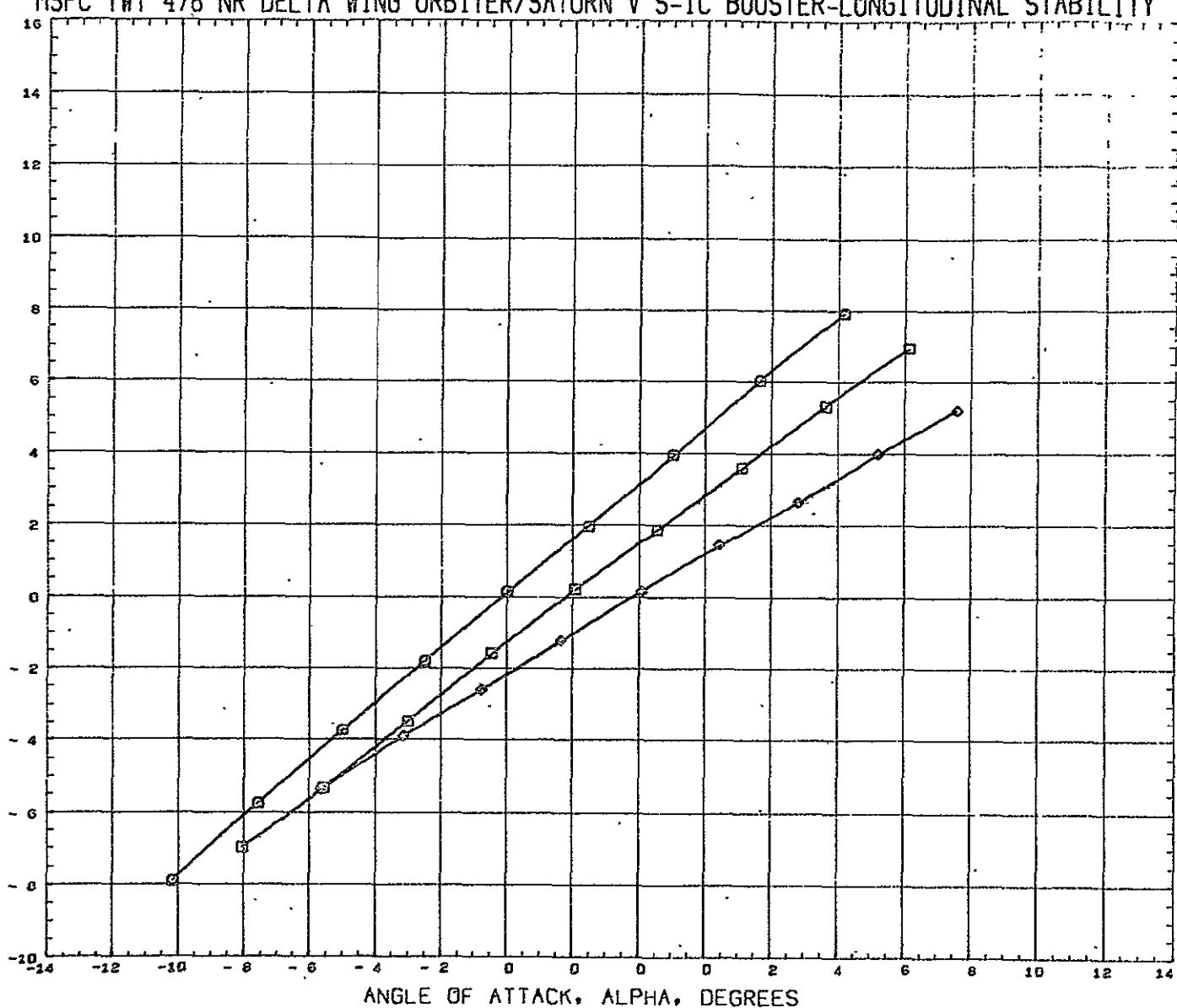


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC
□	0.603			1.000
□	0.901			
◊	0.996			
△	1.103			

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
SFL	1.3330	INCHES
SFB	1.3330	INCHES
HRP	5.2640	INCHES
HRP	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA KIST. CODE MU

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



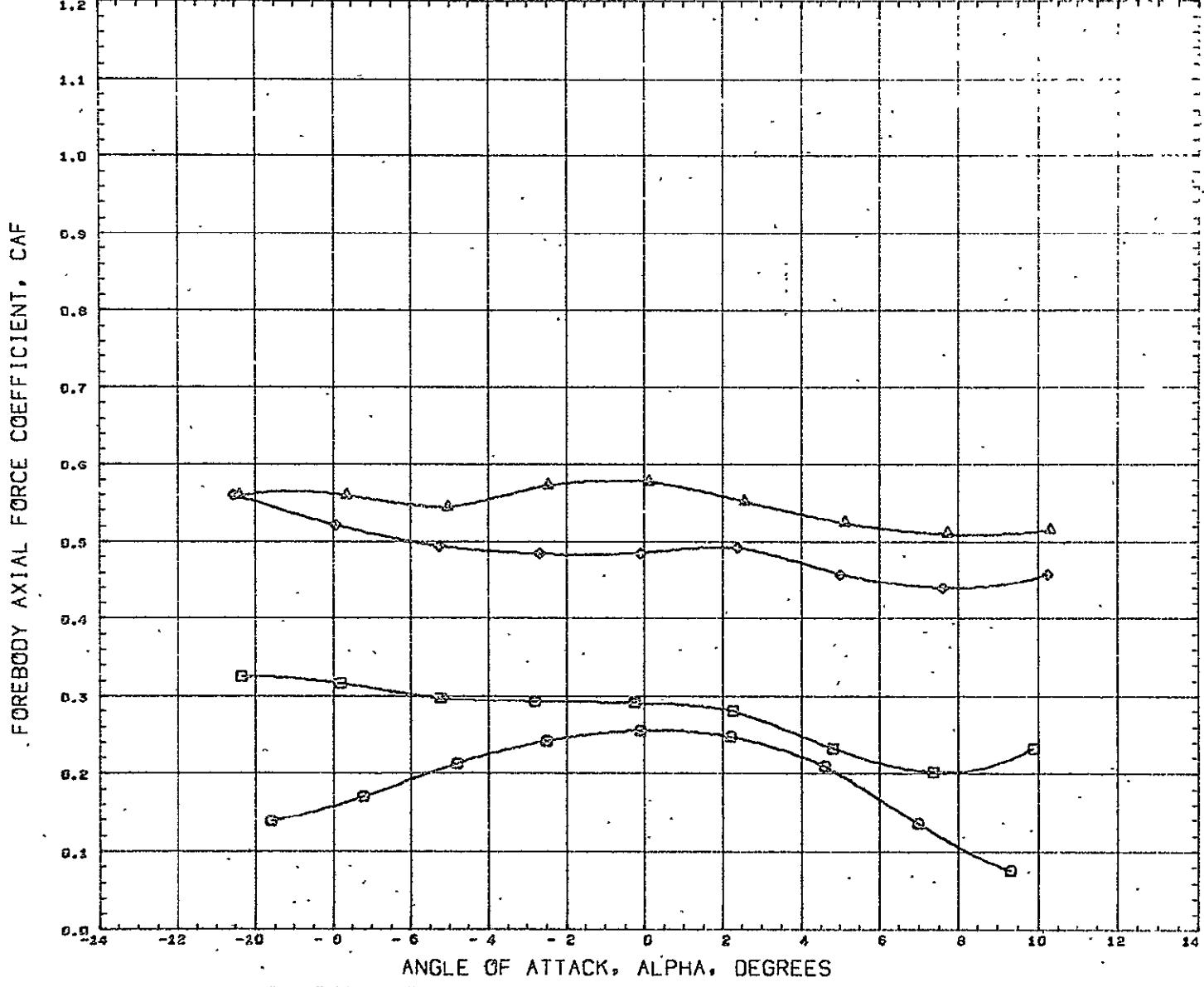
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC
<input type="checkbox"/>	1.195		0.010	1.000
<input type="checkbox"/>	1.467			
<input checked="" type="checkbox"/>	1.965			

REFERENCE INFORMATION		
SFS	1.3960	SO. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE : NH

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 40

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

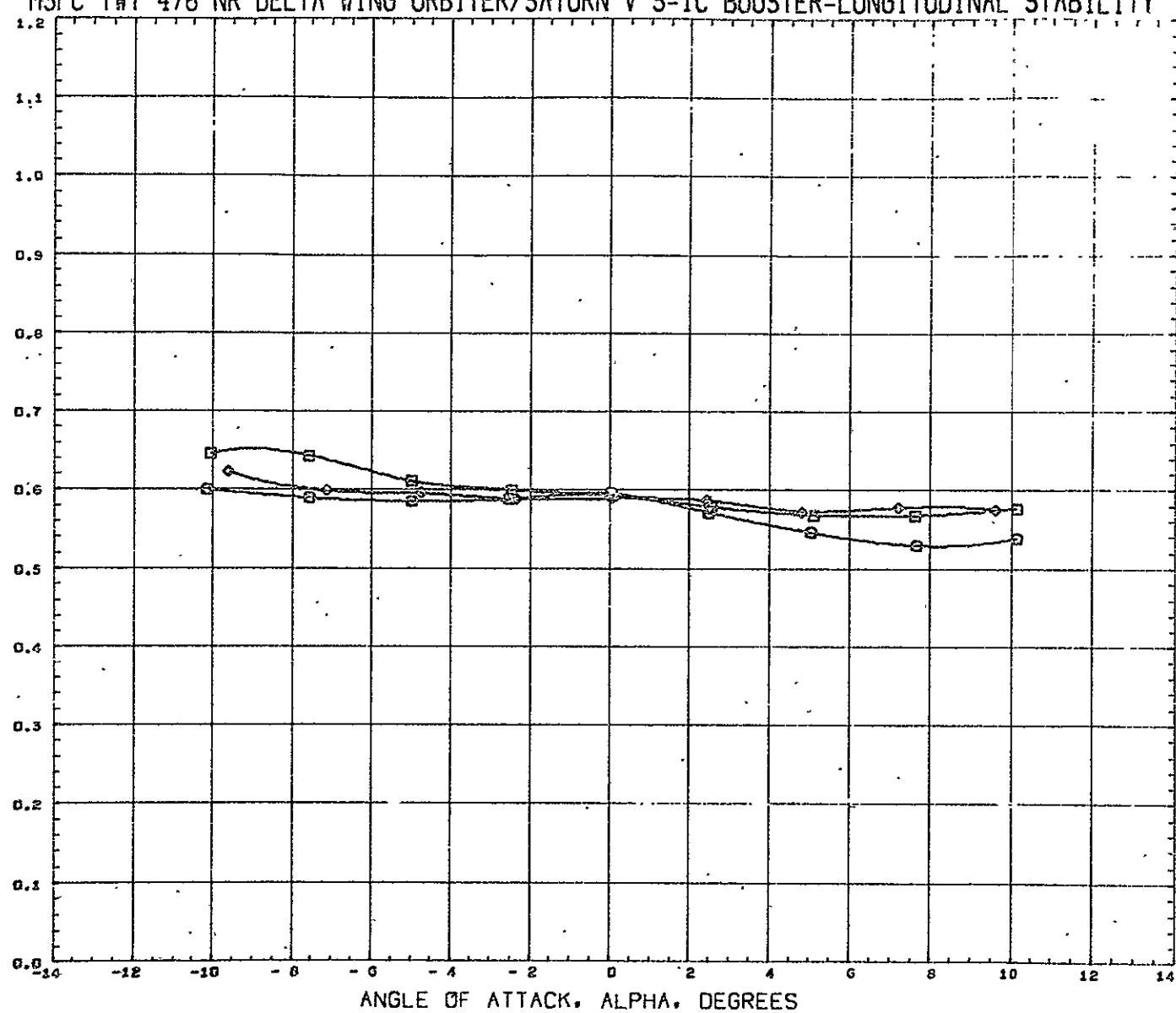
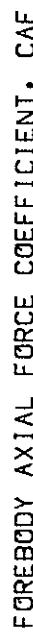


SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	0.603		0.010 ORBINC 1.000
□	0.901		
◊	0.996		
△	1.103		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE . NH

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



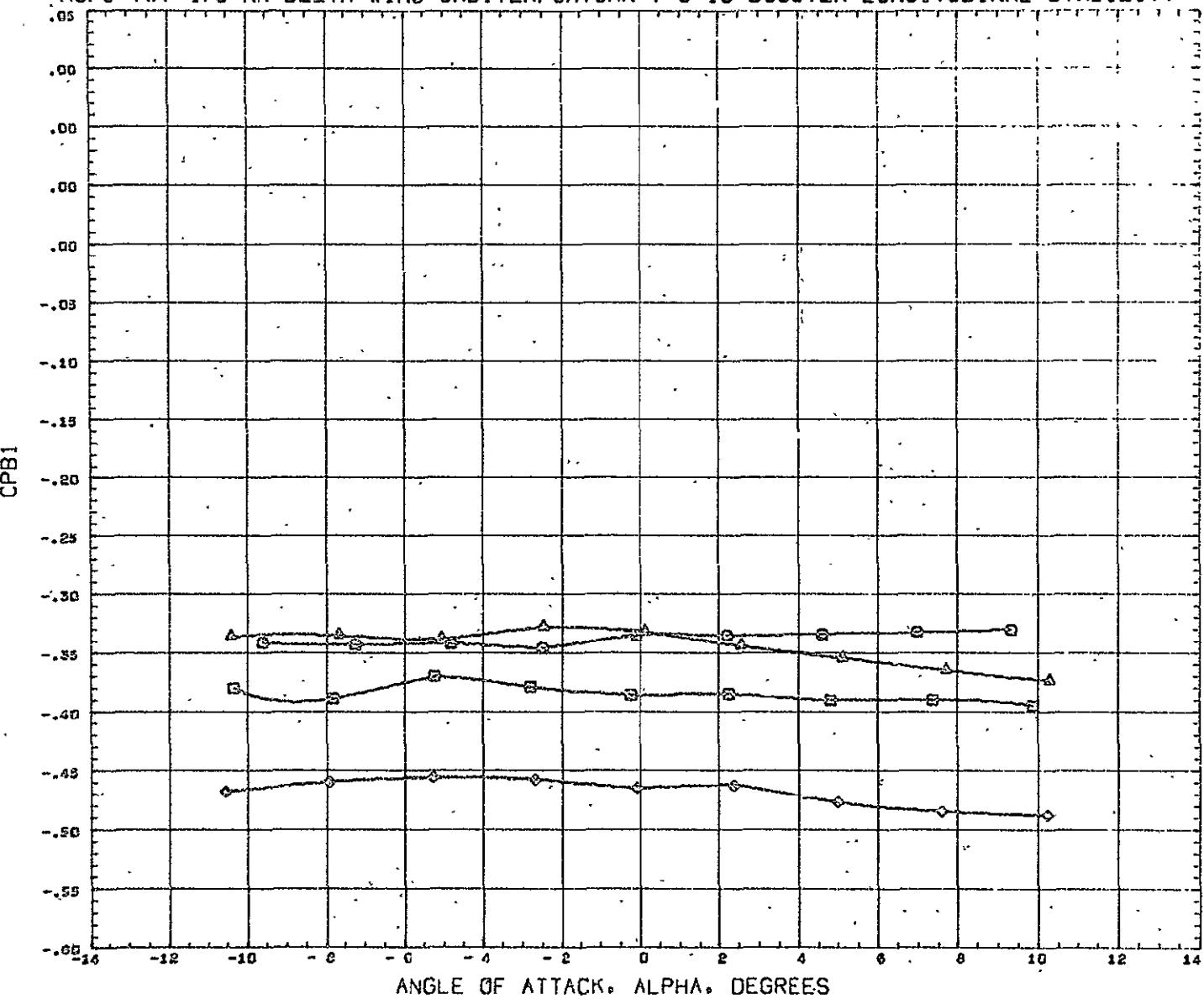
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.D10	ORBINC
□	1.196		0.910	1.000
□	1.467			
◊	1.965			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EF8	1.3330	INCHES
MRF	5.2640	INCHES
MRP	0.0000	INCHES
MRP	0.0330	INCHES
CALE	0.0034	INCHES

DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 42

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

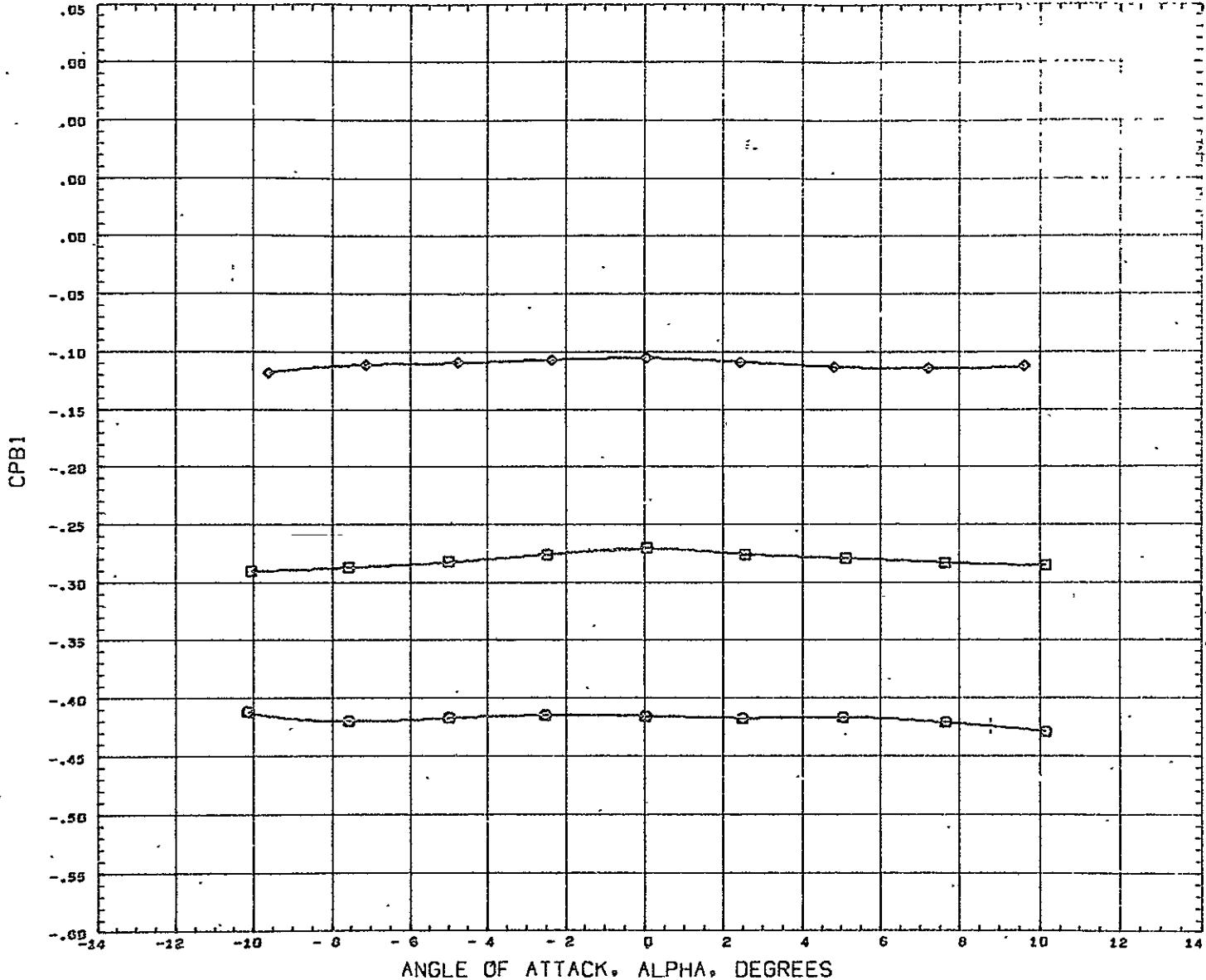


SYMBOL	HACH	PARAMETRIC VALUES		
		BETA	O.010	ORBINC
○	0.803			1.000
□	0.961			
◊	0.096			
△	1.103			

REFERENCE INFORMATION		
FS.	1.3960	SQ. IN.
FL.	1.3330	INCHES
FB	.1.3330	INCHES
RP	.3.2640	INCHES
RP	.0.0000	INCHES
RP	.0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



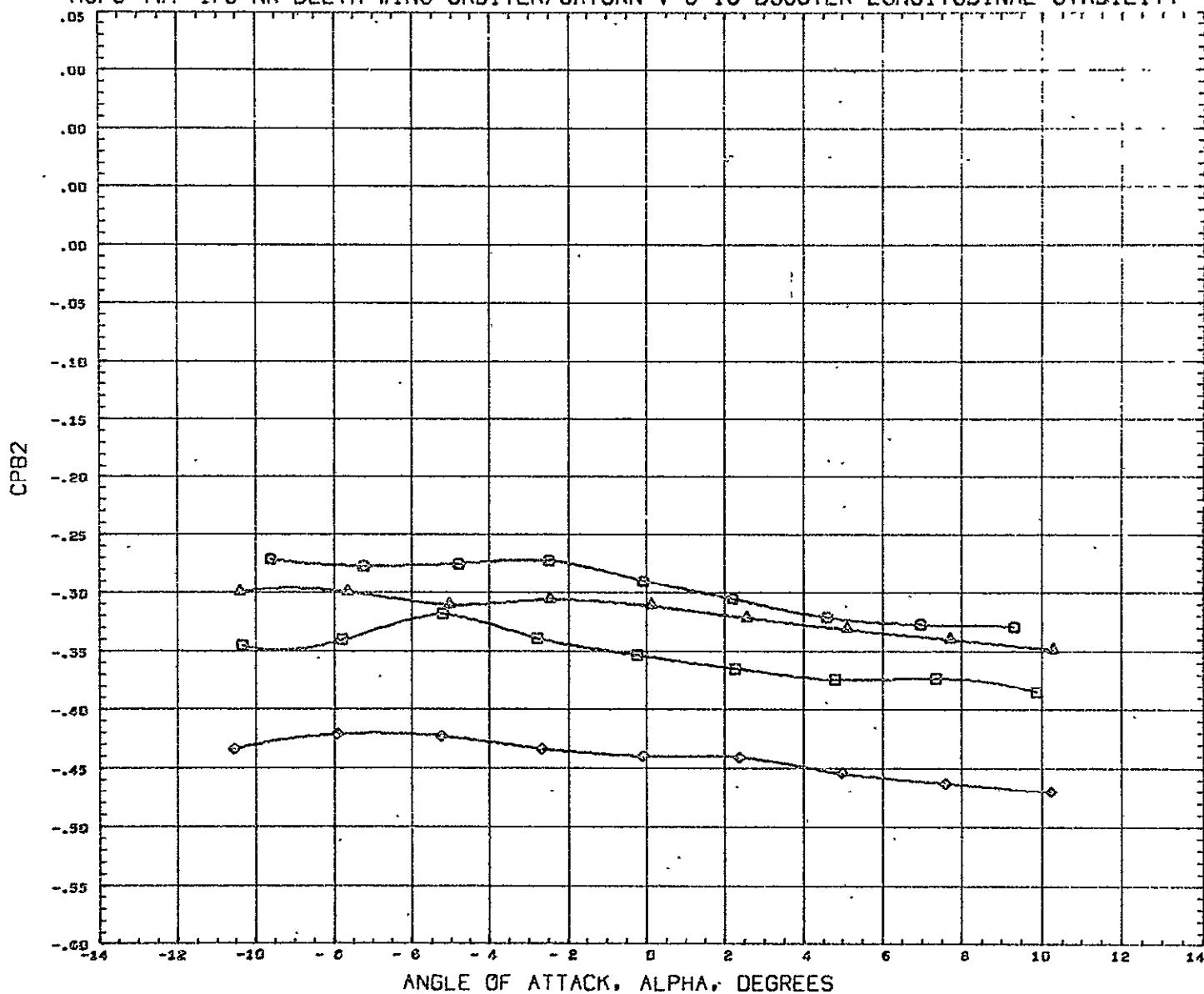
SYMBOL	MACH	BETA	PARAMETRIC VALUES
O	1.196		0.010 ORBINC 1,000
□	1.467		
◊	1.965		

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RP	0.0000	INCHES
RP	0.0330	INCHES
ALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 44

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC
□	0.603			1.000
□	0.901			
◊	0.996			
△	1.103			

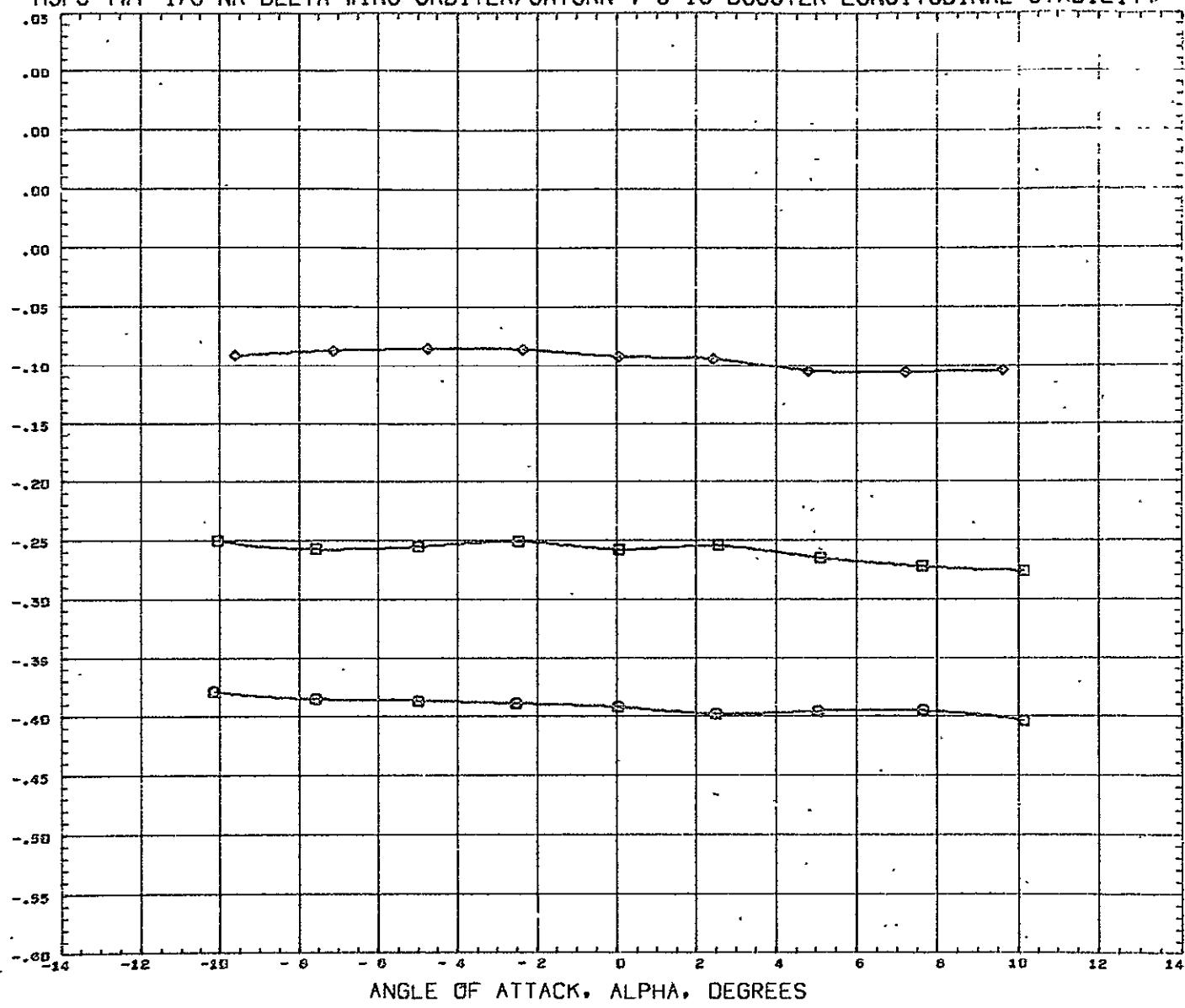
REFERENCE INFORMATION		
CFS	1.3960	SQ.IN.
CFL	1.3330	INCHES
CFB	1.3330	INCHES
HRP	5.2640	INCHES
IRP	0.0000	INCHES
IRP	0.0330	INCHES
CALE	0.0034	

DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 45

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB2



SYMBOL MACH PARAMETRIC VALUES
 ◻ 1.196 BETA 0.010 ORBINC 1.000

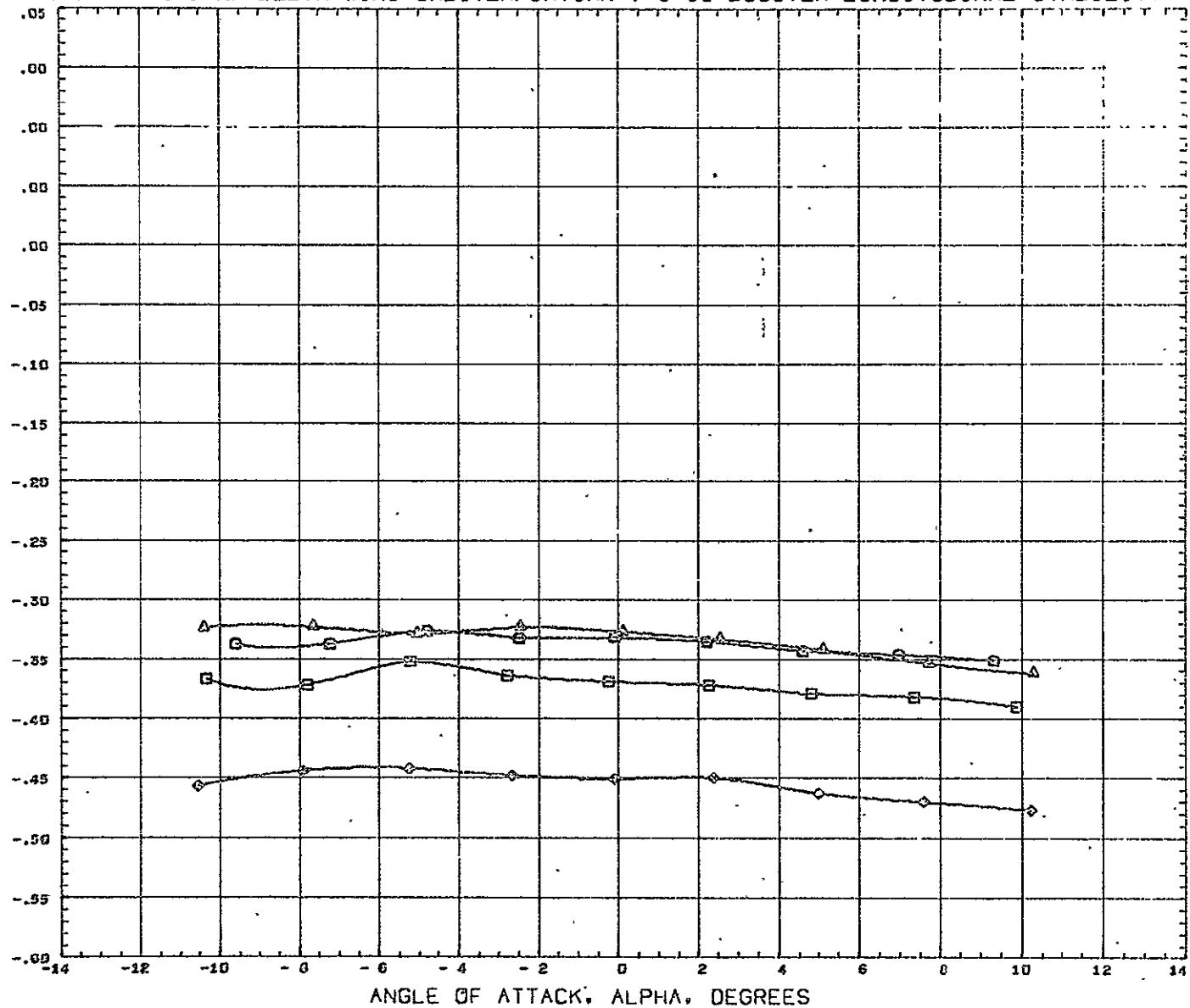
REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA MIST. CODE MH

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 46

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPCAV



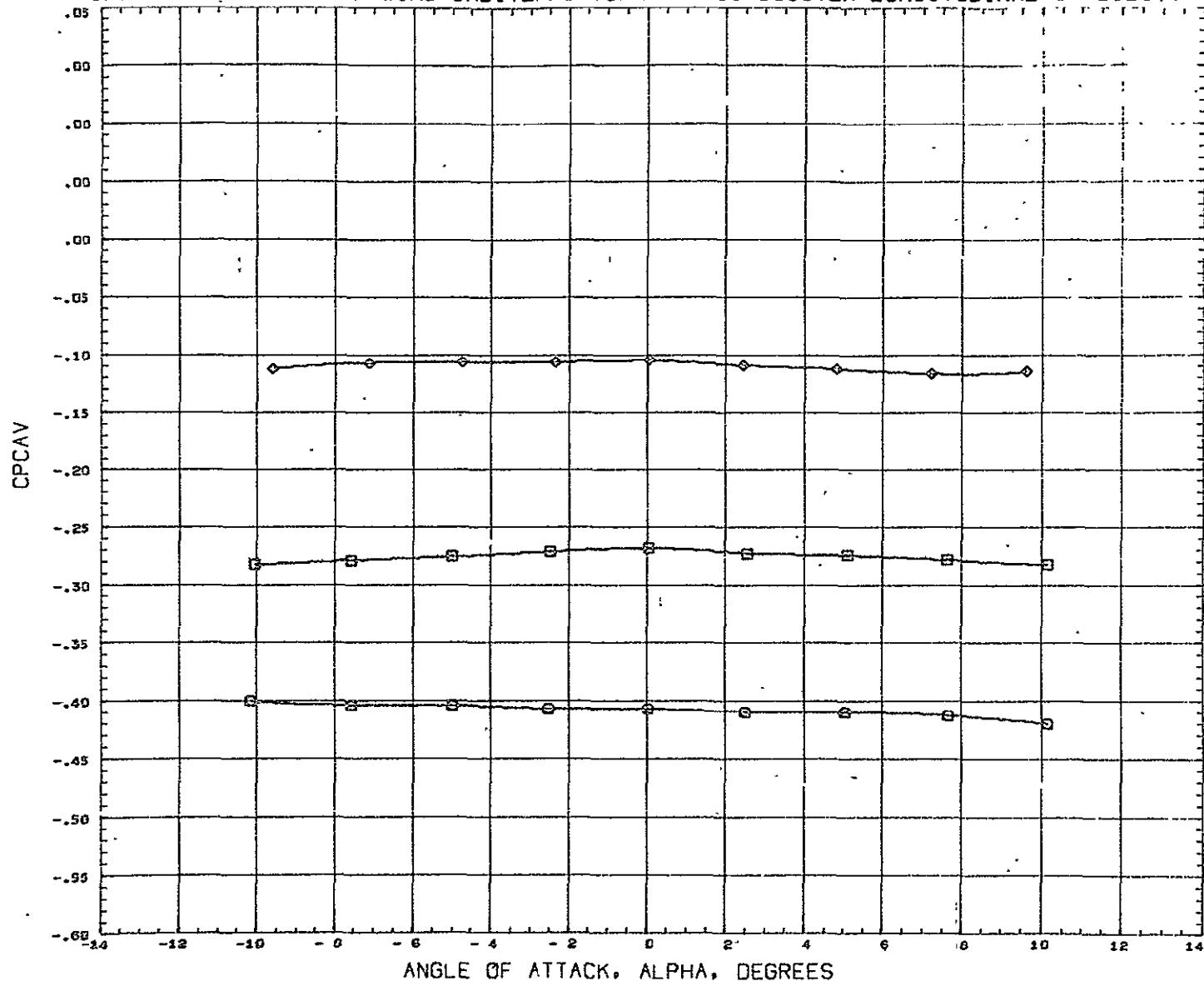
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL HACH PARAMETRIC VALUES
 ○ 0.603 BETA 0.010 ORBINC 1.000
 □ 0.901
 ◇ 0.996
 △ 1.103

DATA MIST. CODE MM

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 RETB 1.3330 INCHES
 XMRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



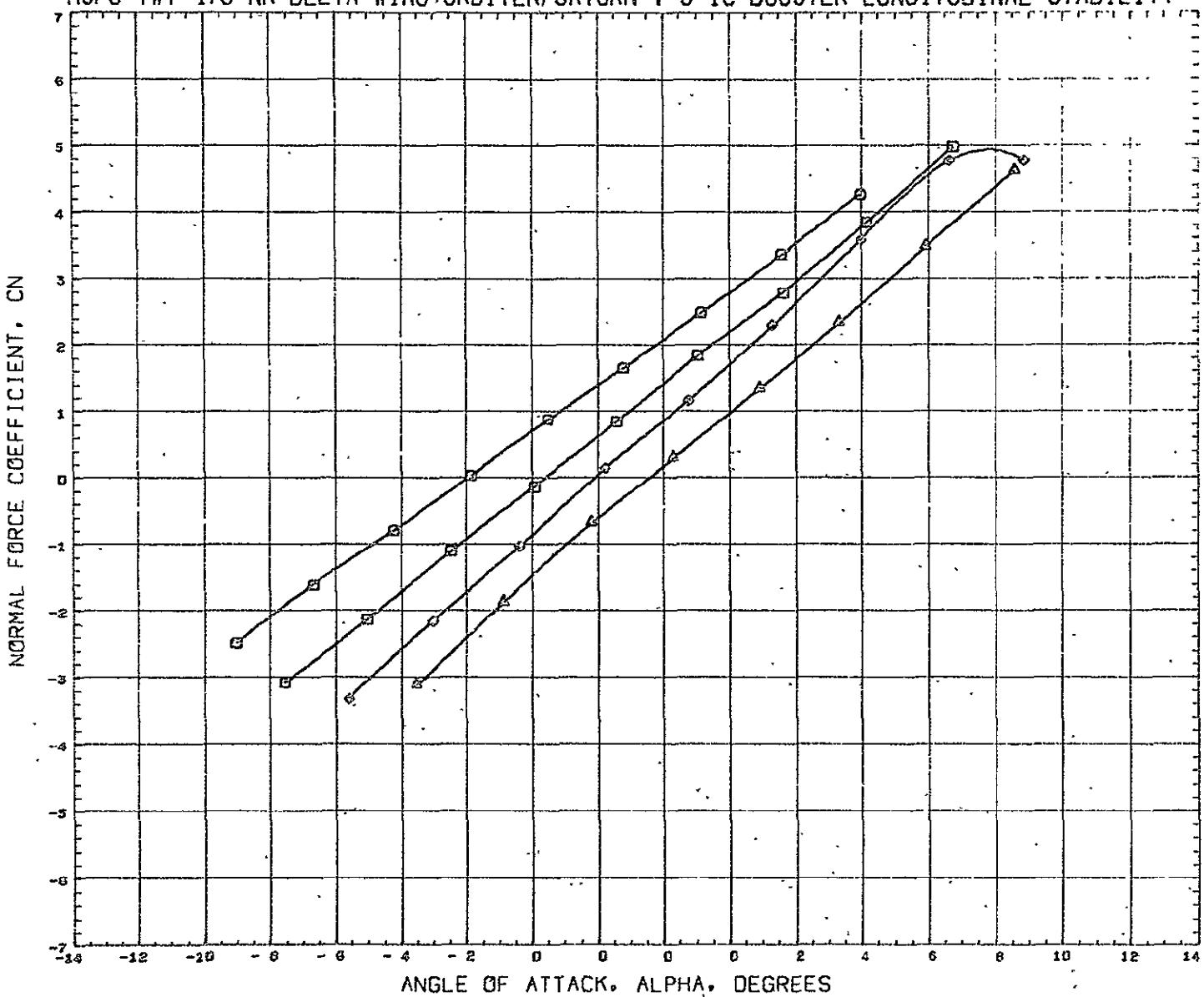
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC
○	1.196			1.000
□	1.467			
◊	1.965			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE HH

MSFC 476 NR HCR0RB/S-1C8000STER BS+B5W14E3V17 (R25061) 08 JAN 71 PAGE 48

MSFC TWT 476 NR: DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

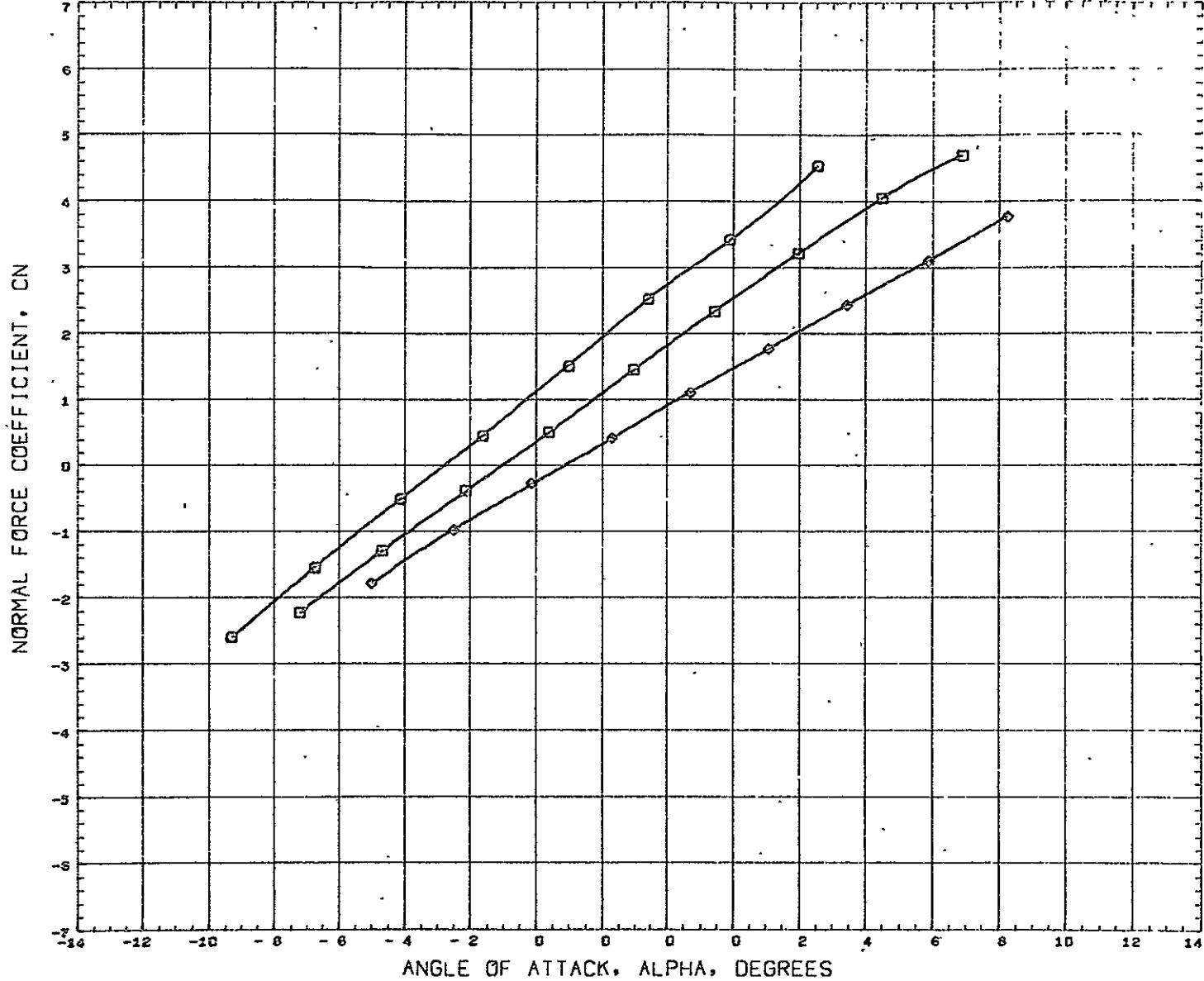


SYMBOL	RACH	PARAMETRIC VALUES		
		BETA	-	ORBINC'
□	0.600		- 0.020	4.000
□	0.689			
○	0.992			
△	1.093			

REFERENCE FILE

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



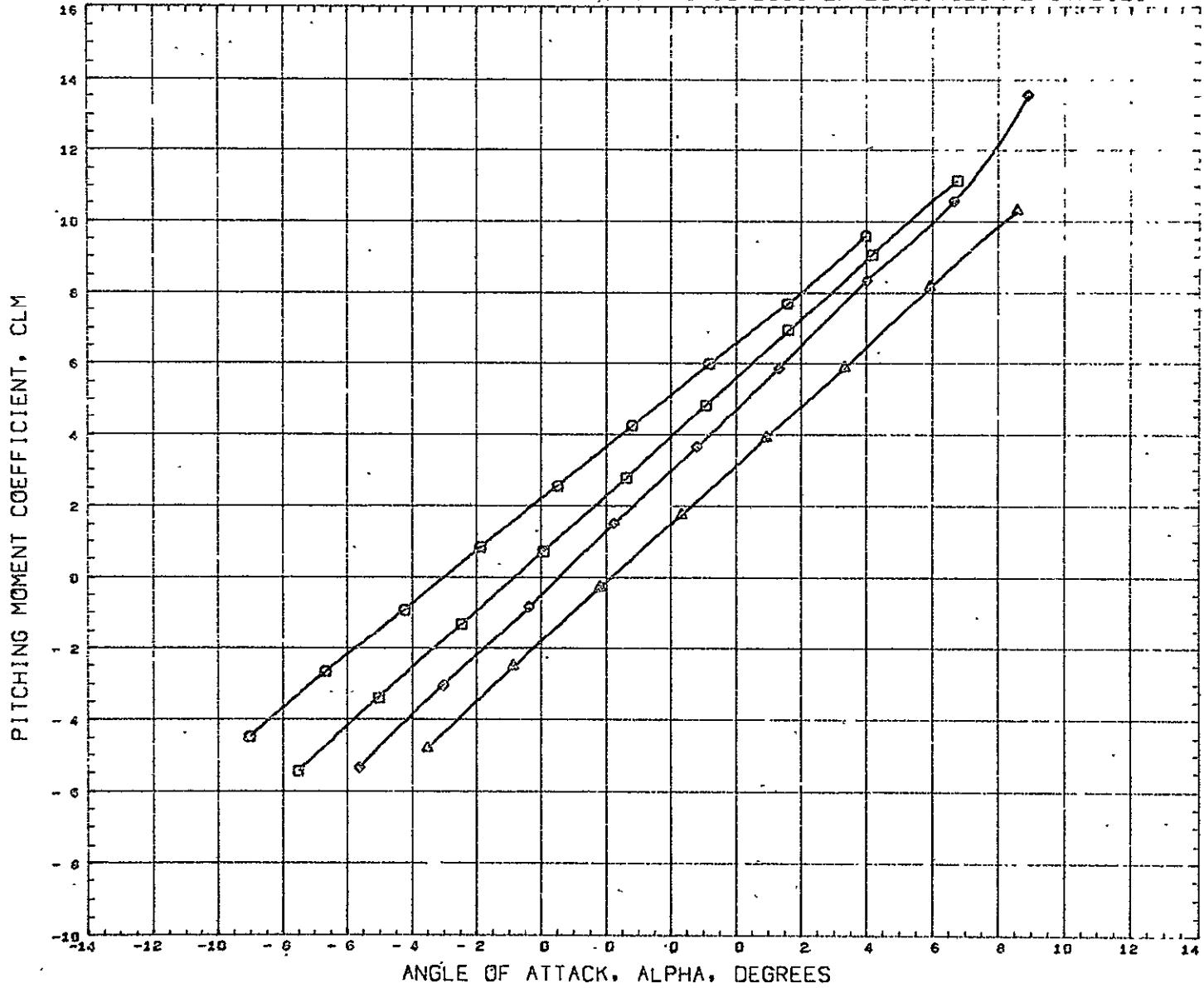
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
□	1.198		0.020	4.000
□	1.455			
◊	1.967			

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
SFL	1.3330	INCHES
SFB	1.3330	INCHES
IRP	5.2640	INCHES
IRF	0.0000	INCHES
IRP	0.0330	INCHES
CALE	0.0034	

REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25071) 31 DEC 70 PAGE 50

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

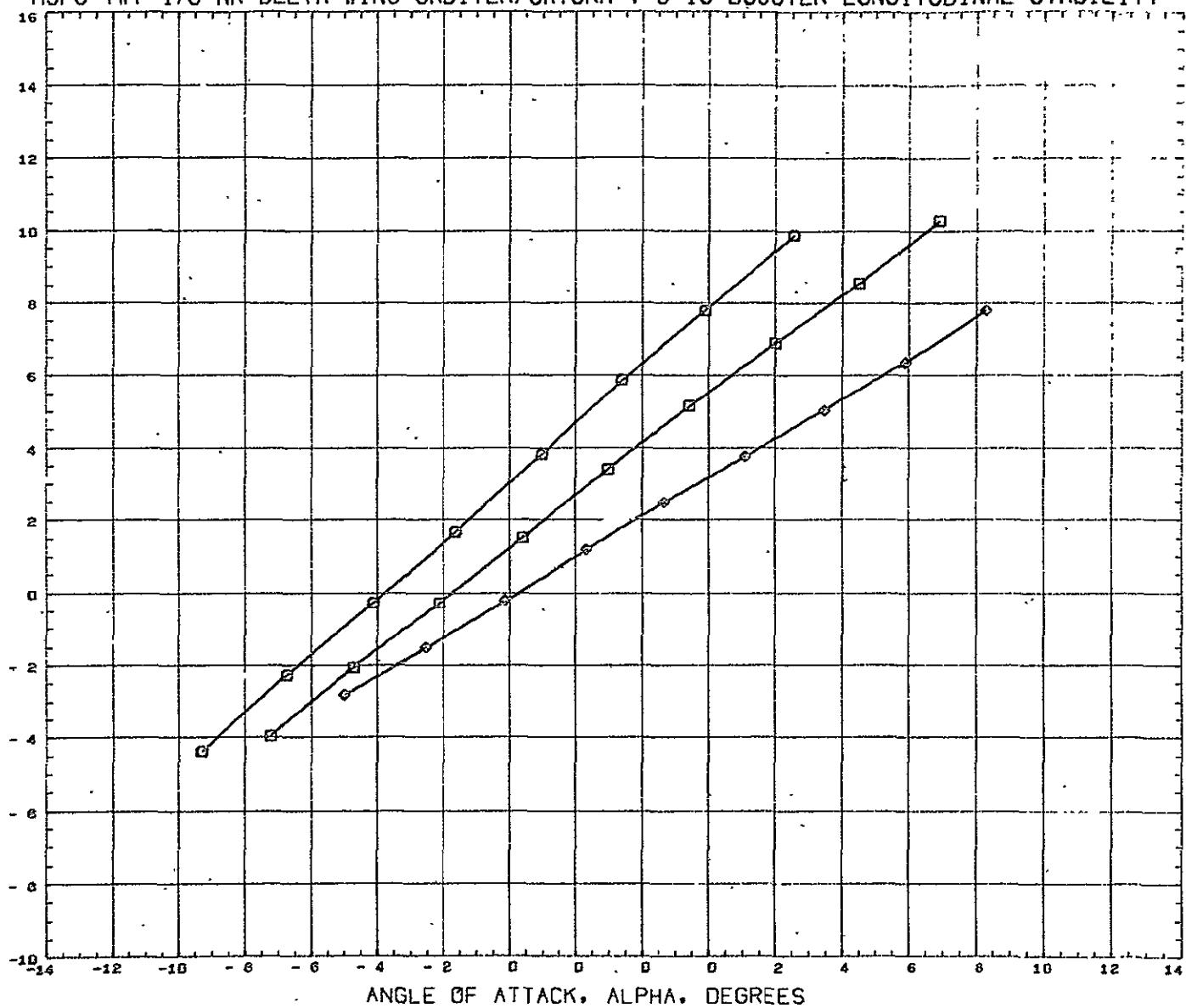


REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (R25071) 31 DEC 70 PAGE 51

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM

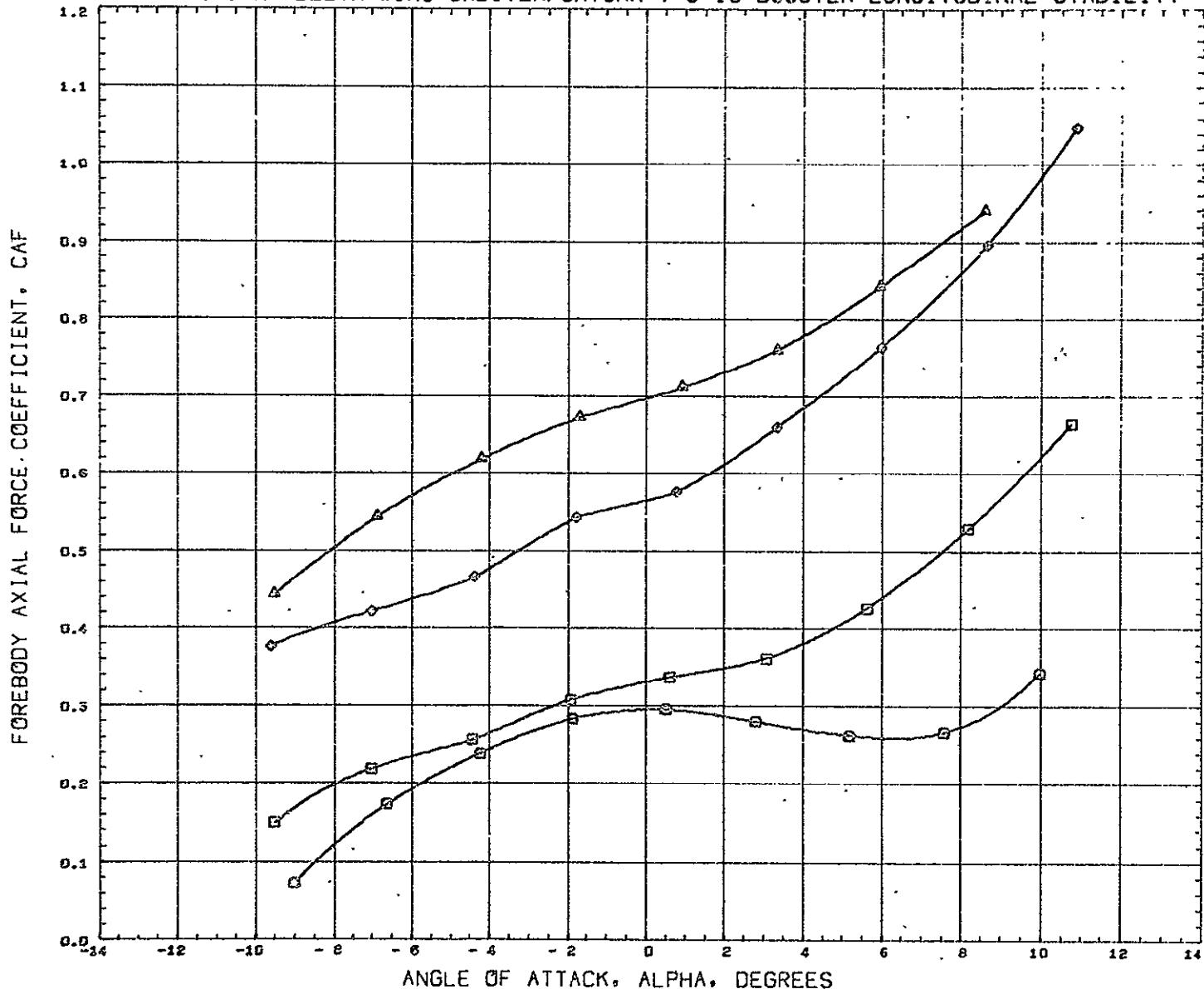


SYMBOL MACH PARAMETRIC VALUES
 ○ 1.199 BETA - 0.020 ORBINC 4.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

REFERENCE FILE

MSFC TWT 476-NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

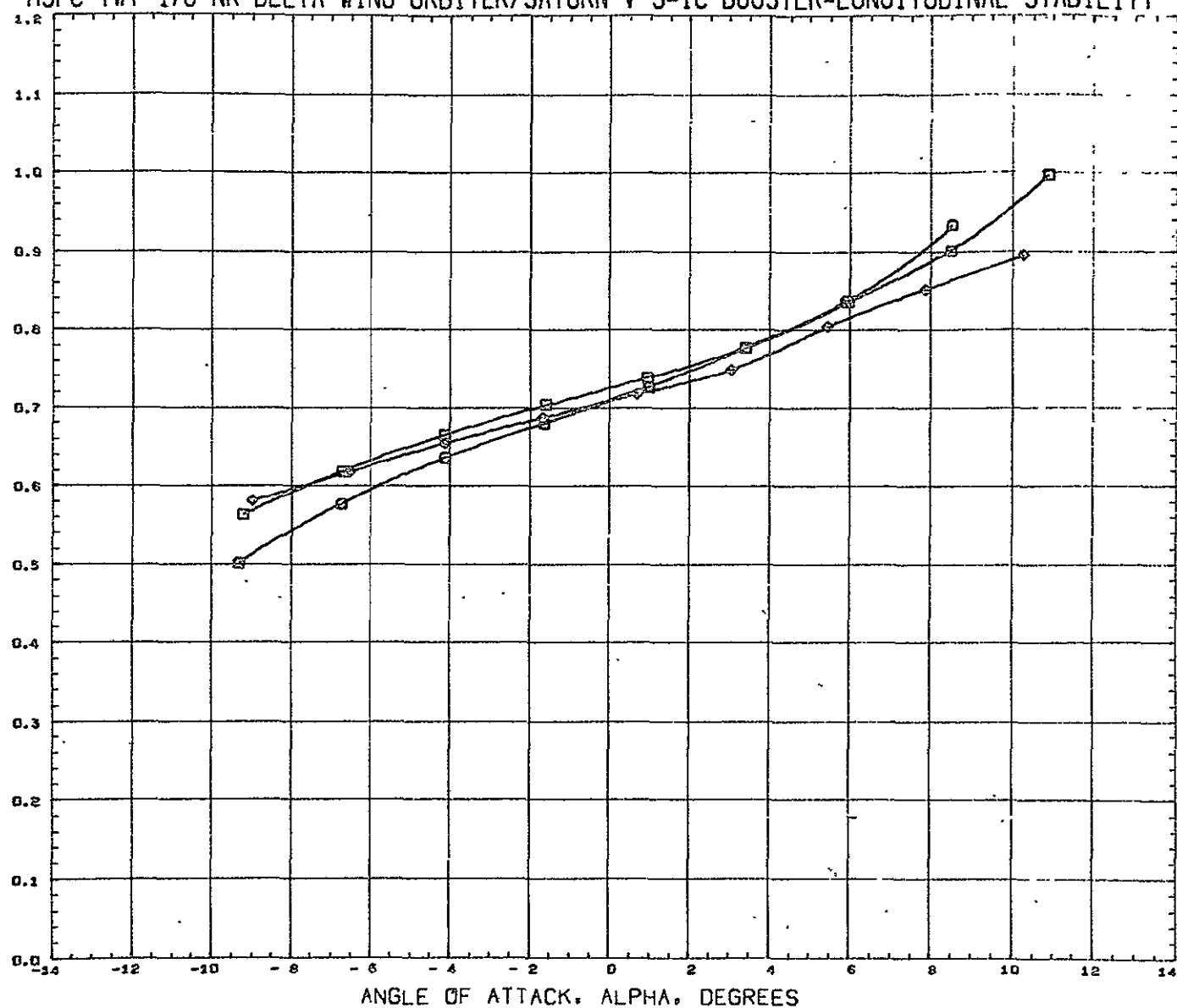
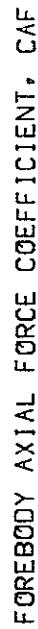


SYMBOL	MACH	PARAMETRIC VALUES			
		BETA	-	0.020	ORBINC
○	0.600				
□	0.889				
◊	0.992				
△	1.093				

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	

REFERENCE FILE

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	1.199		- 0.020 ORBINC 4.000
□	1.455		
◊	1.967		

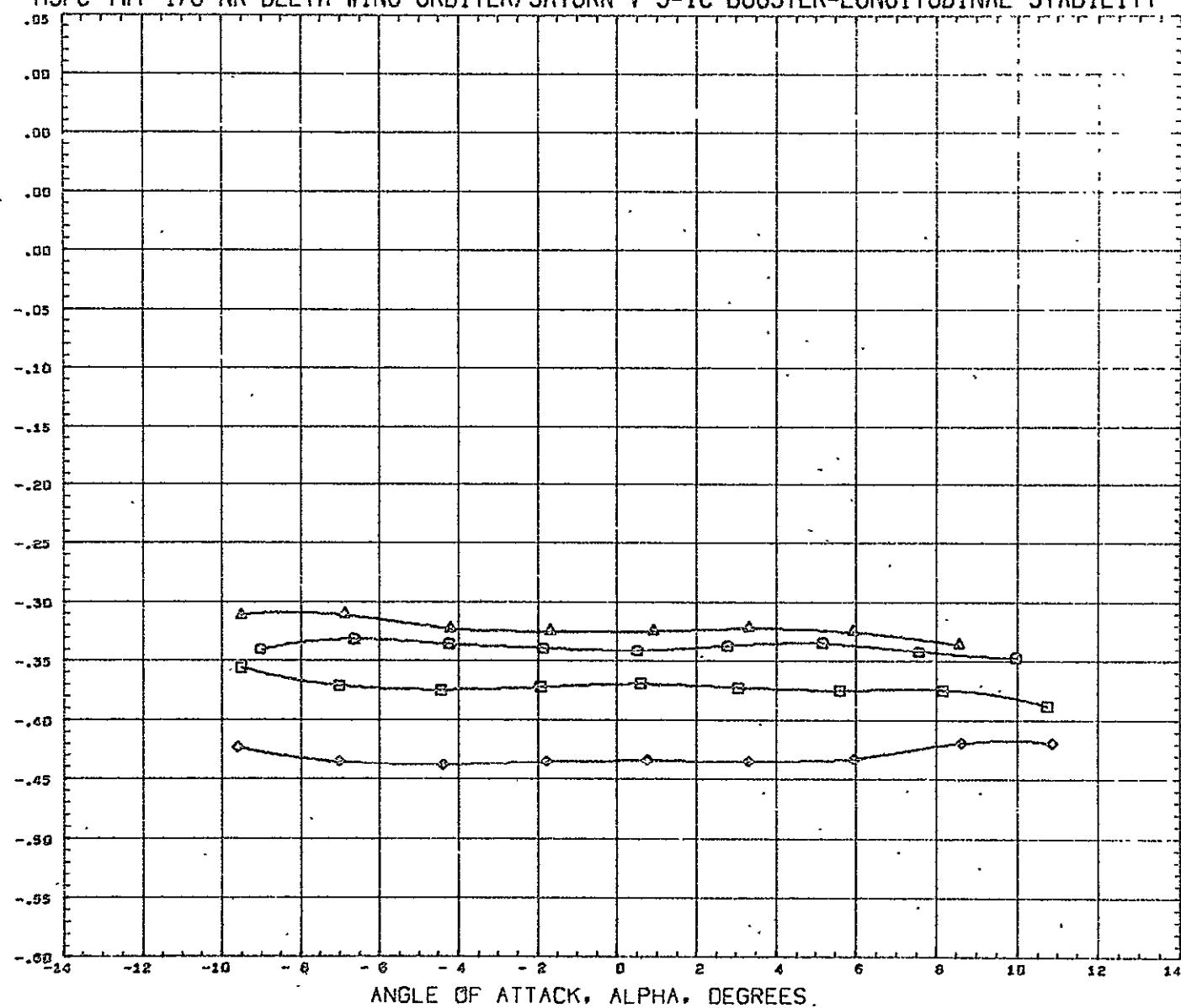
REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	INCHES

REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25071) 31 DEC 70 . PAGE 54

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB1



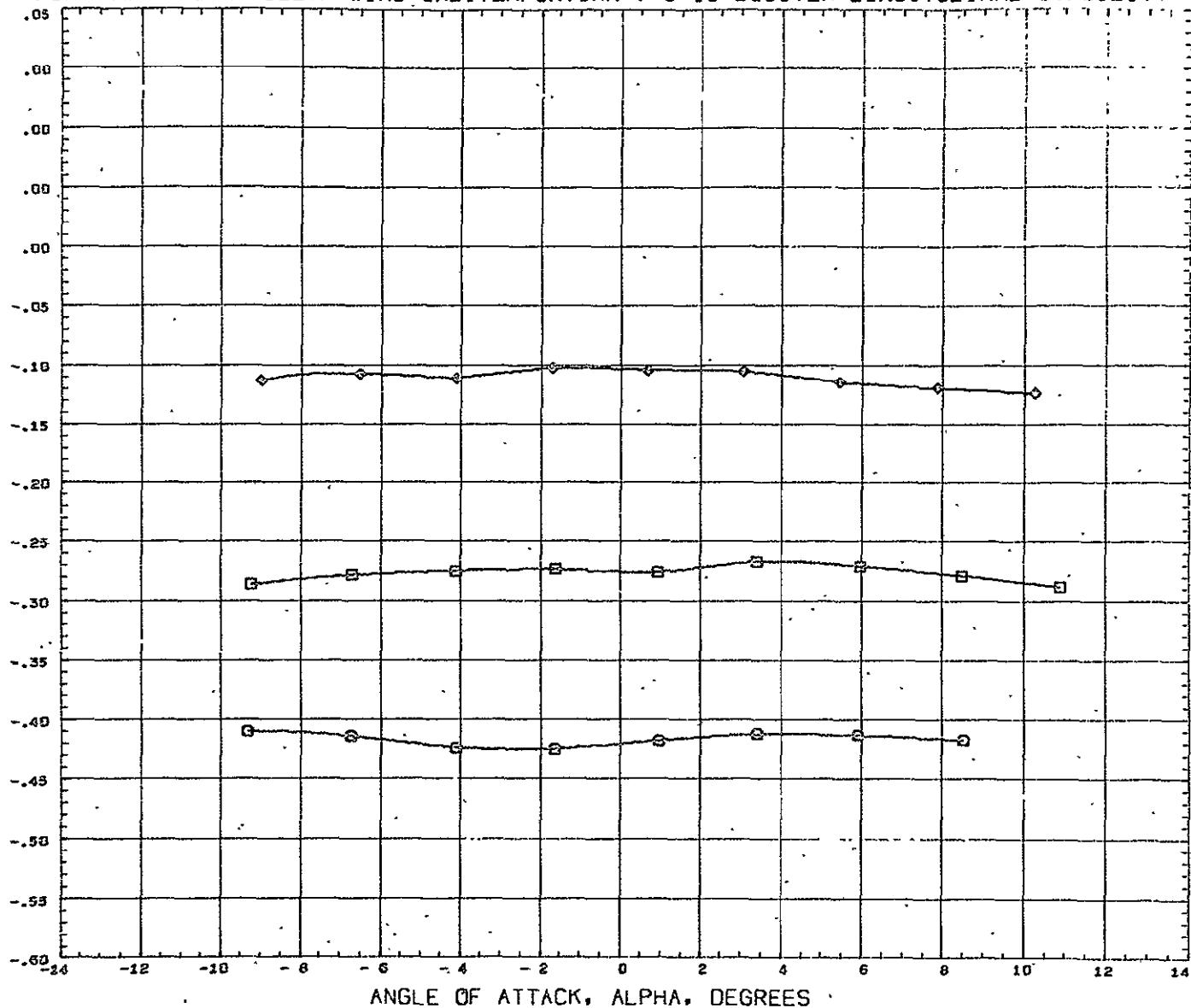
ANGLE OF ATTACK, ALPHA, DEGREES.

SYMBOL HACH PARAMETRIC VALUES
 □ 0.600 BETA - 0.020 ORBINC 4.000
 □ 0.069
 ◊ 0.992
 △ 1.093

REFERENCE FILE

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRP 5.2640 INCHES
 YHRP 0.0000 INCHES
 ZHRP 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



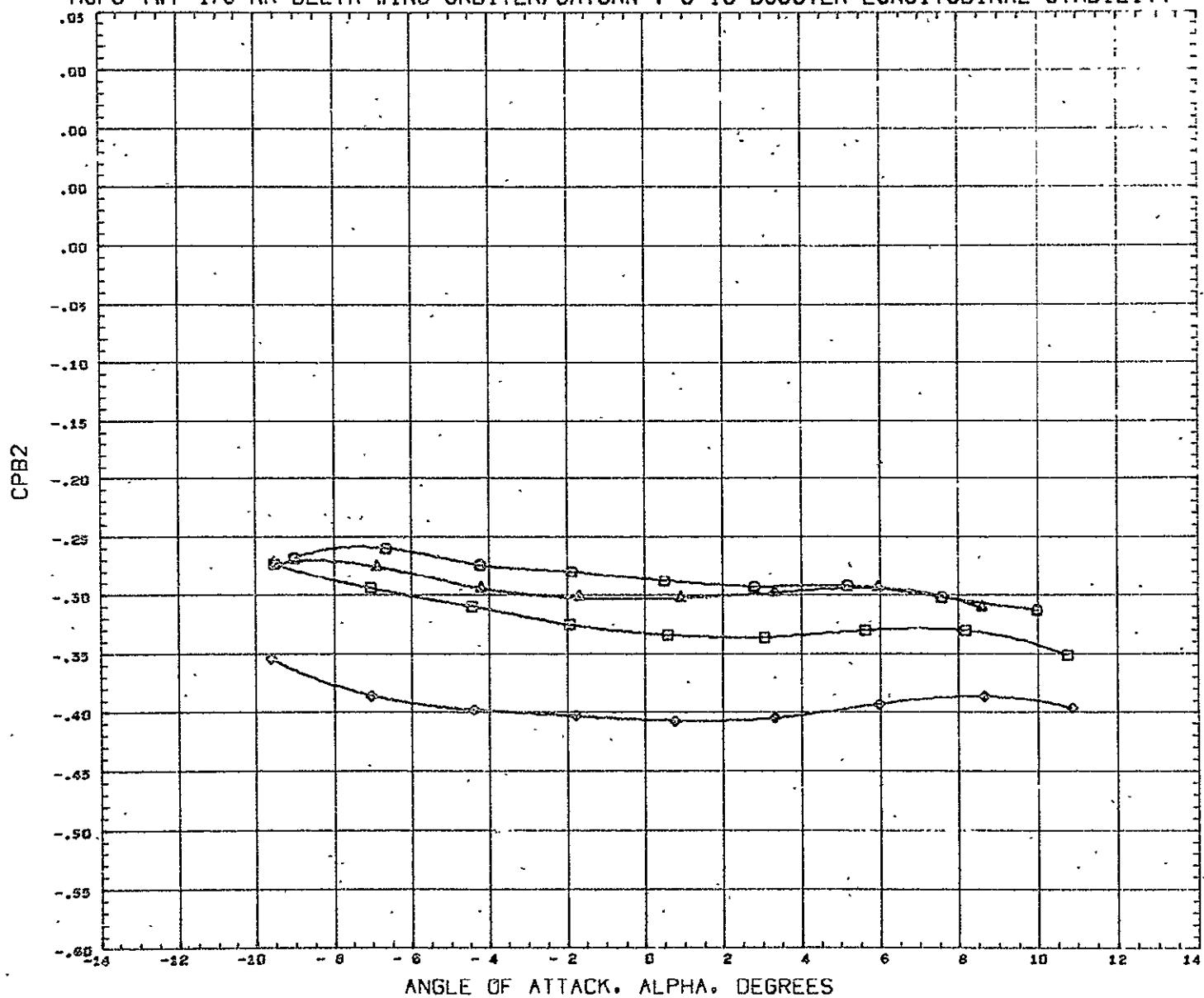
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
○	1.198		0.020	.4.000
□	1.455			
◊	1.967			

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 [R25071] 31 DEC 70 PAGE 56

~MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

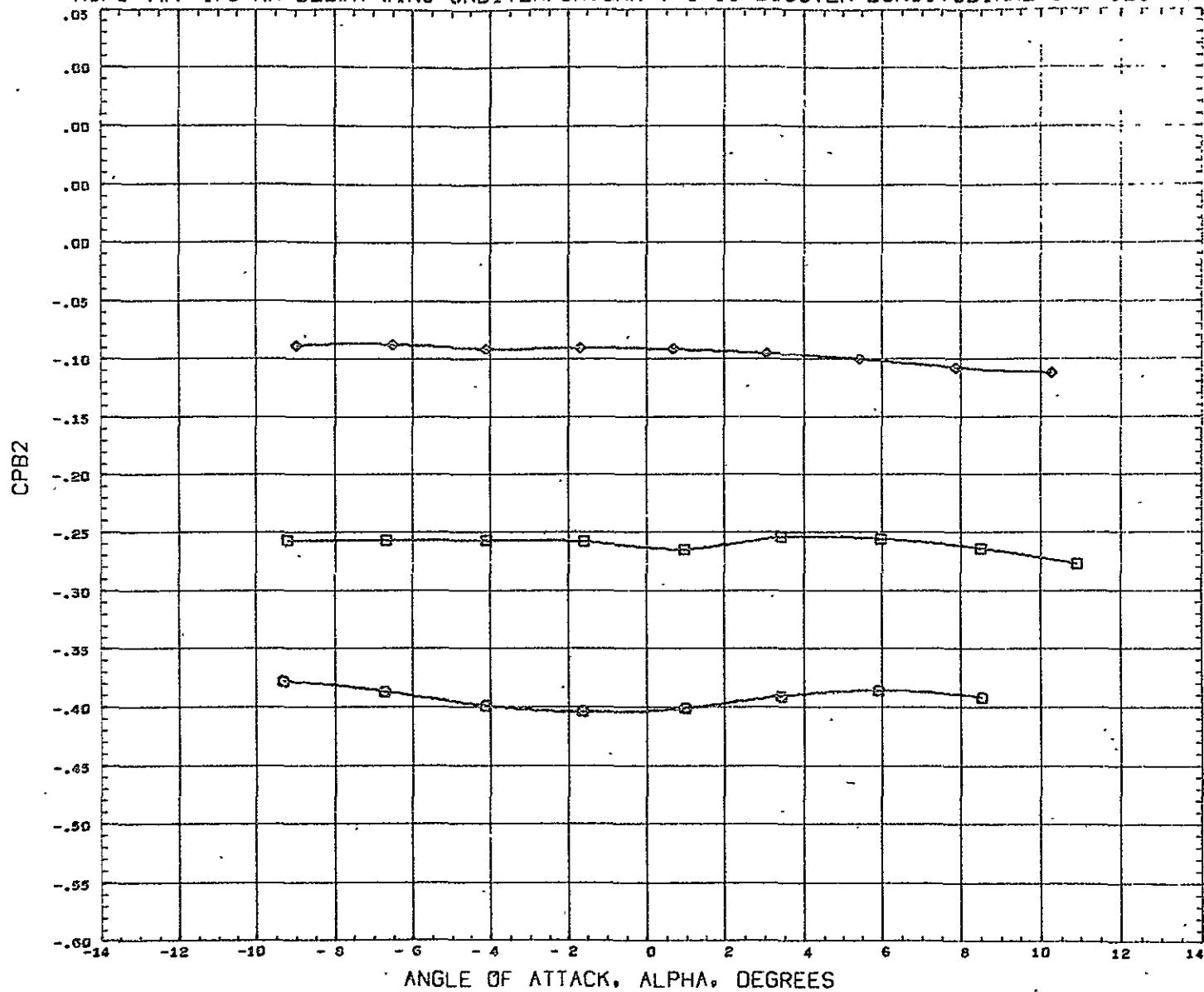


SYMBOL	MACH	PARAMETRIC VALUES		
○	0.600	BETA	- 0.020	ORBINC 4.000
□	0.689			
◊	0.992			
△	1.093			

REFERENCE INFORMATION		
FS	1.3960	SQ.IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
IRF	5.2640	INCHES
IRF	0.0000	INCHES
IRF	0.0330	INCHES
CALE	0.0034	

REFERENCE FILE

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY.



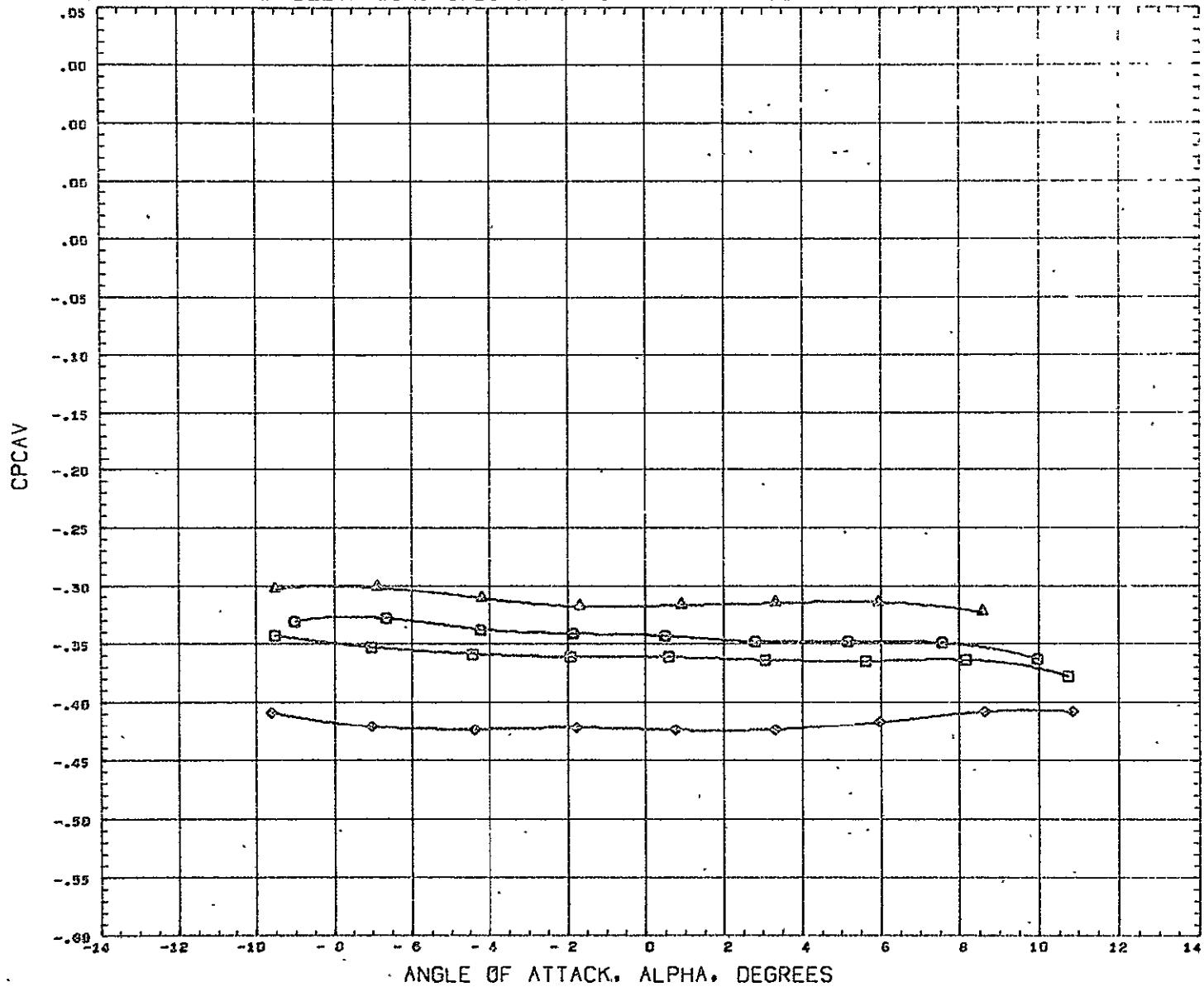
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
O	1.199		0.020	4.000
□	1.455			
◊	1.967			
			.	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25071) 31 DEC 70 PAGE 58

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

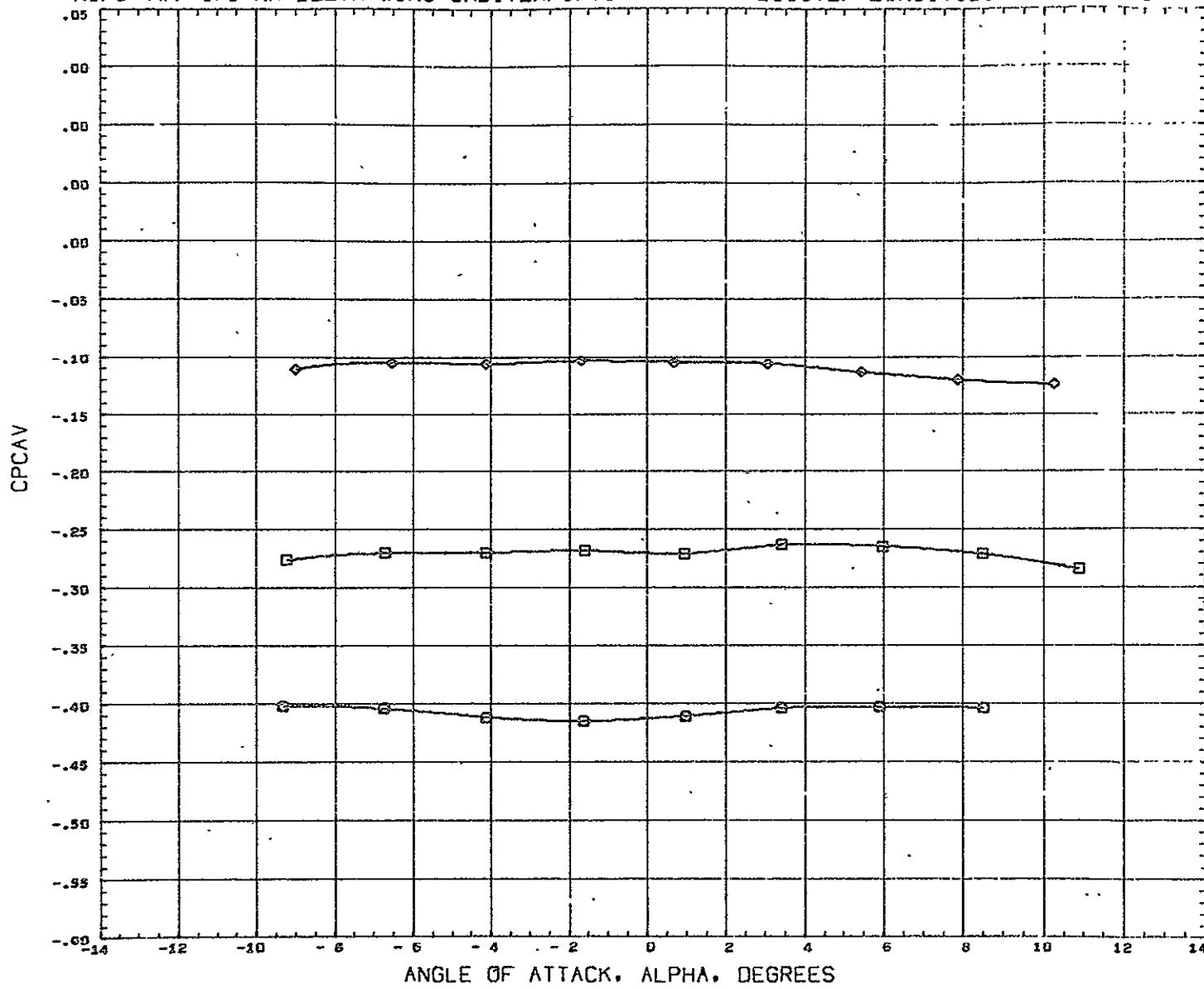


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.600 BETA - 0.020 ORBINC 4.000
 □ 0.889
 ◇ 0.992
 △ 1.093

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034 INCHES

REFERENCE FILE

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



		PARAMETRIC VALUES		
SYMBOL	MACH	BETA	- B.020	ORBINC
□	1.199			4.000
□	1.455			
◊	1.967			

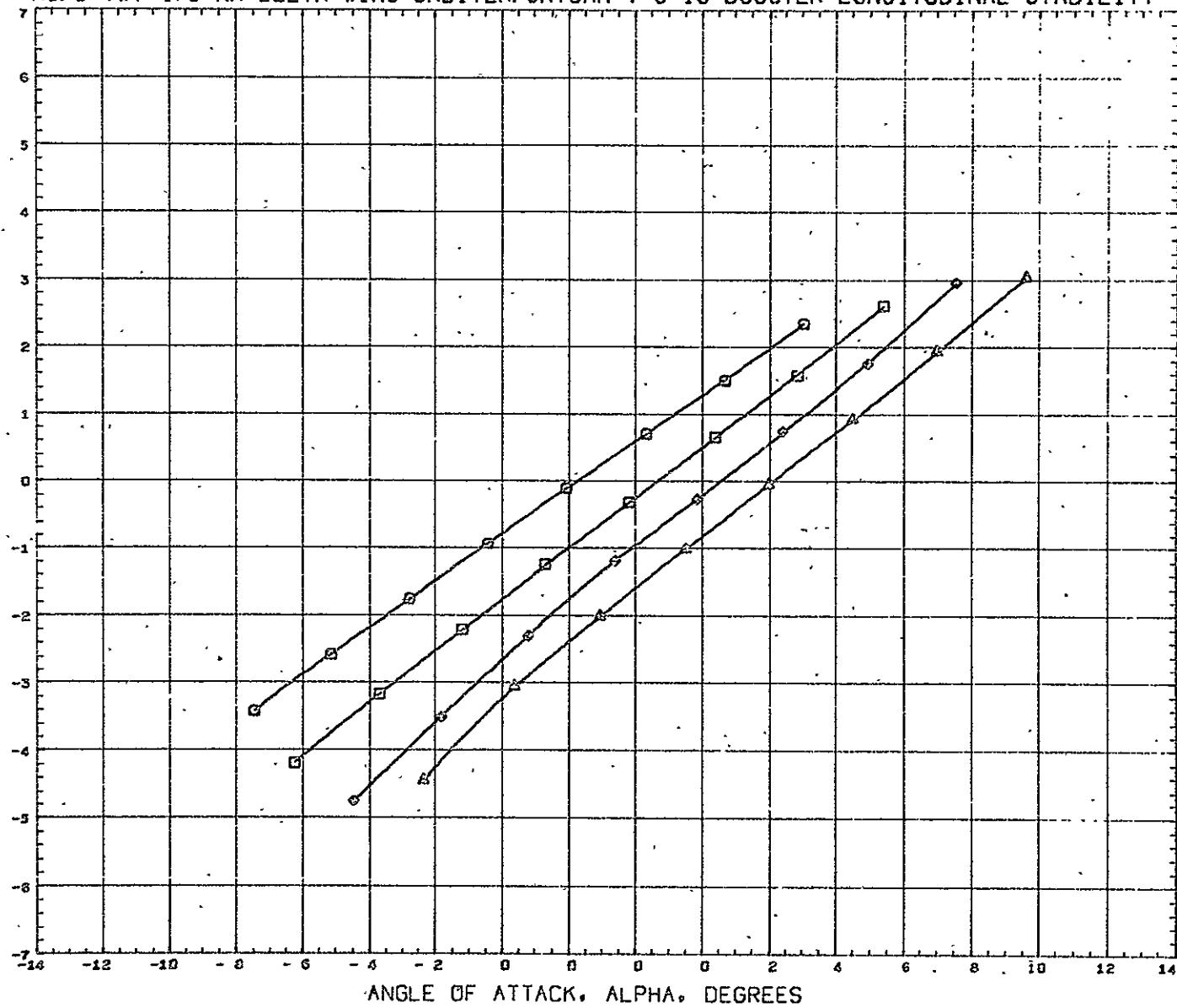
REFERENCE INFORMATION		
FS	1.3960	SQ.IN.
FFL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

REFERENCE FILE

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25071) 31 DEC 70 PAGE 60

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE COEFFICIENT, CN

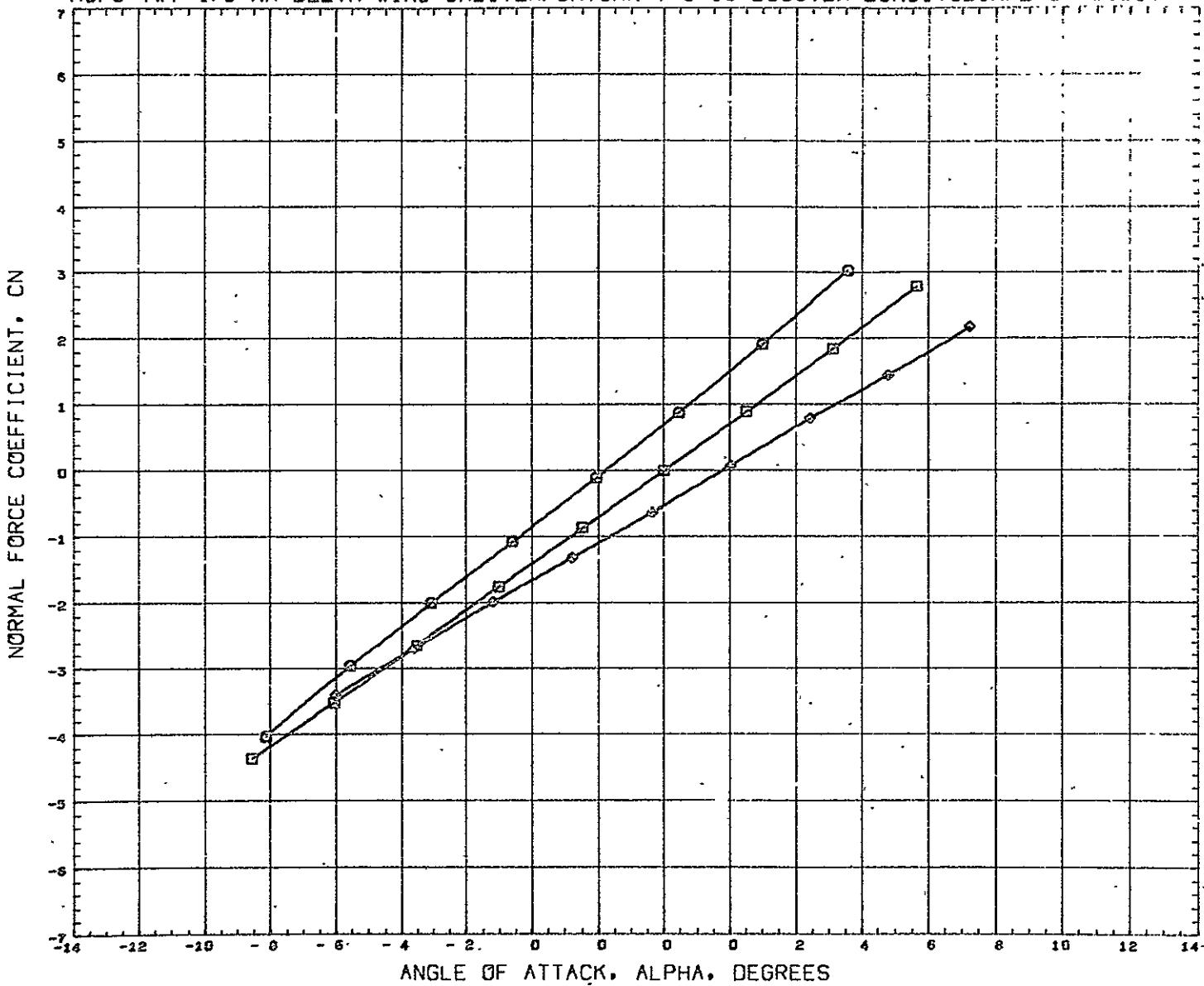


SYMBOL MACH PARAMETRIC VALUES
 ◻ 0.600 BETA 0.000 ORBINC - 2.000
 □ 0.696
 ◇ 1.002
 △ 1.101

DATA MIST. CODE MN

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRP 5.2540 INCHES
 YMRF 0.0000 INCHES
 ZMRP 0.0350 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



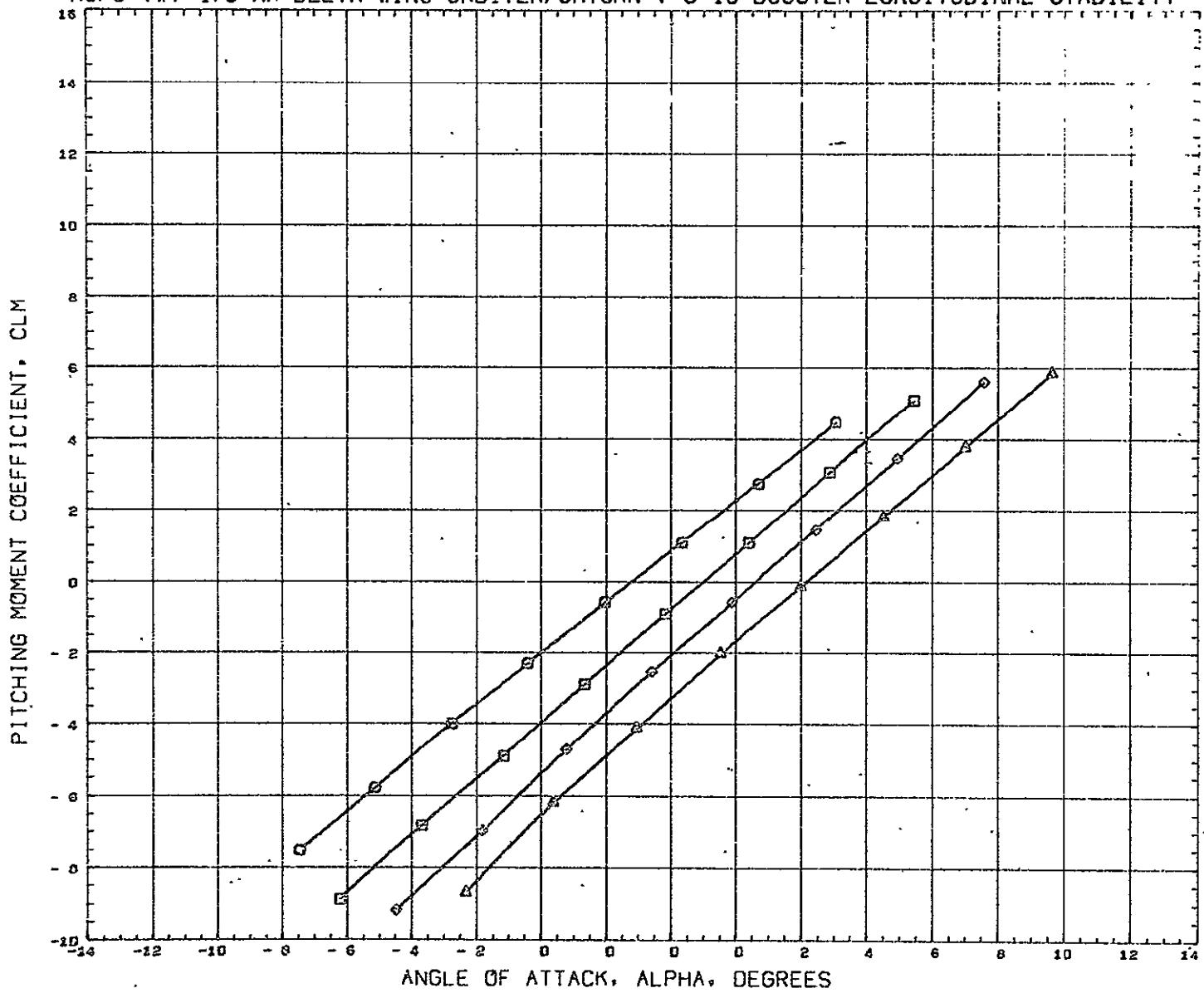
SYMBOL	MACH	BETA	PARAMETRIC VALUES		
○	1.198		0.000	ORBINC	- 2.000
□	1.459				
◊	1.955				

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRP	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 62

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

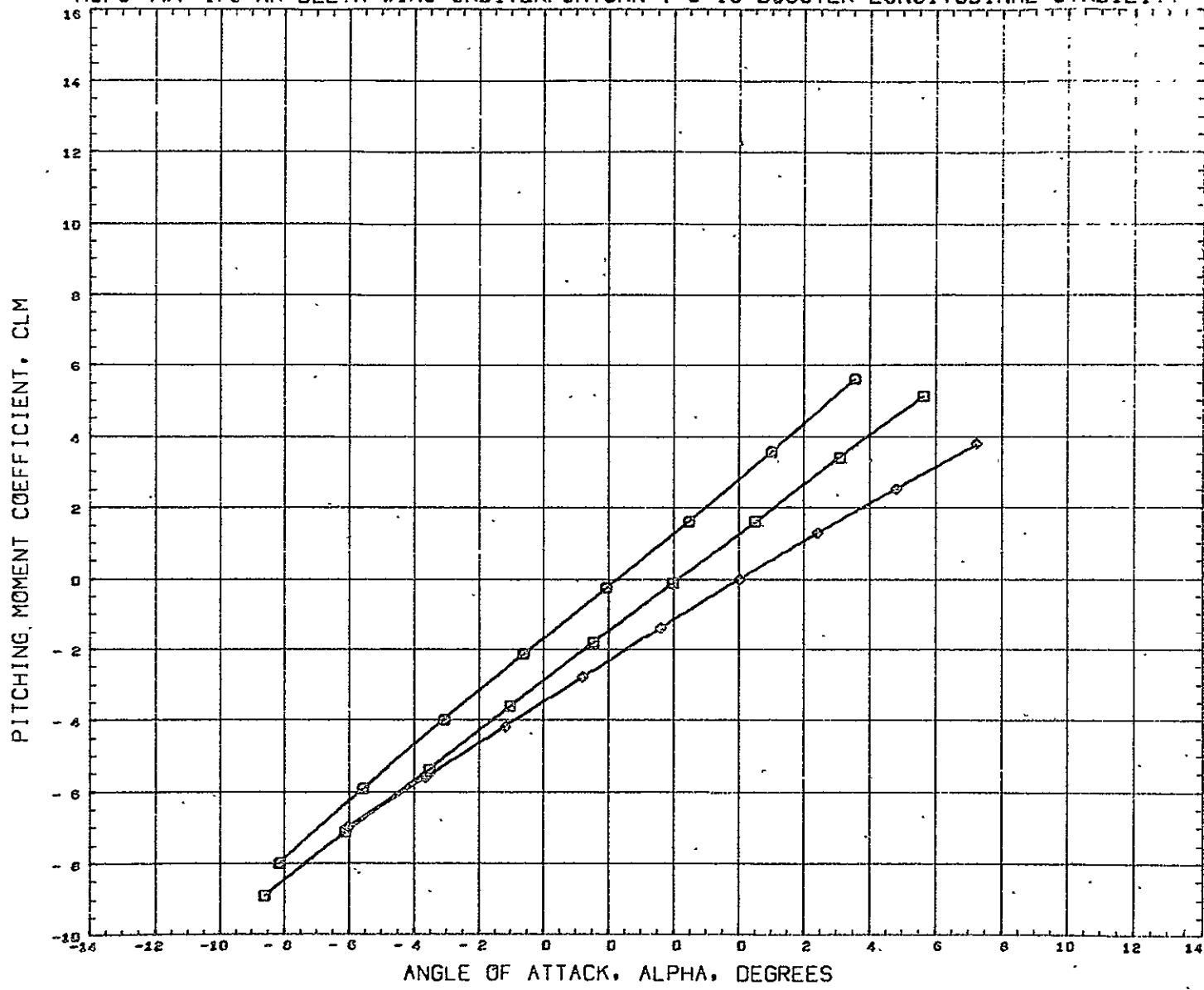


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.000	ORBINC - 2.000
□	0.680			
□	0.895			
◊	1.002			
△	1.101			

DATA NIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



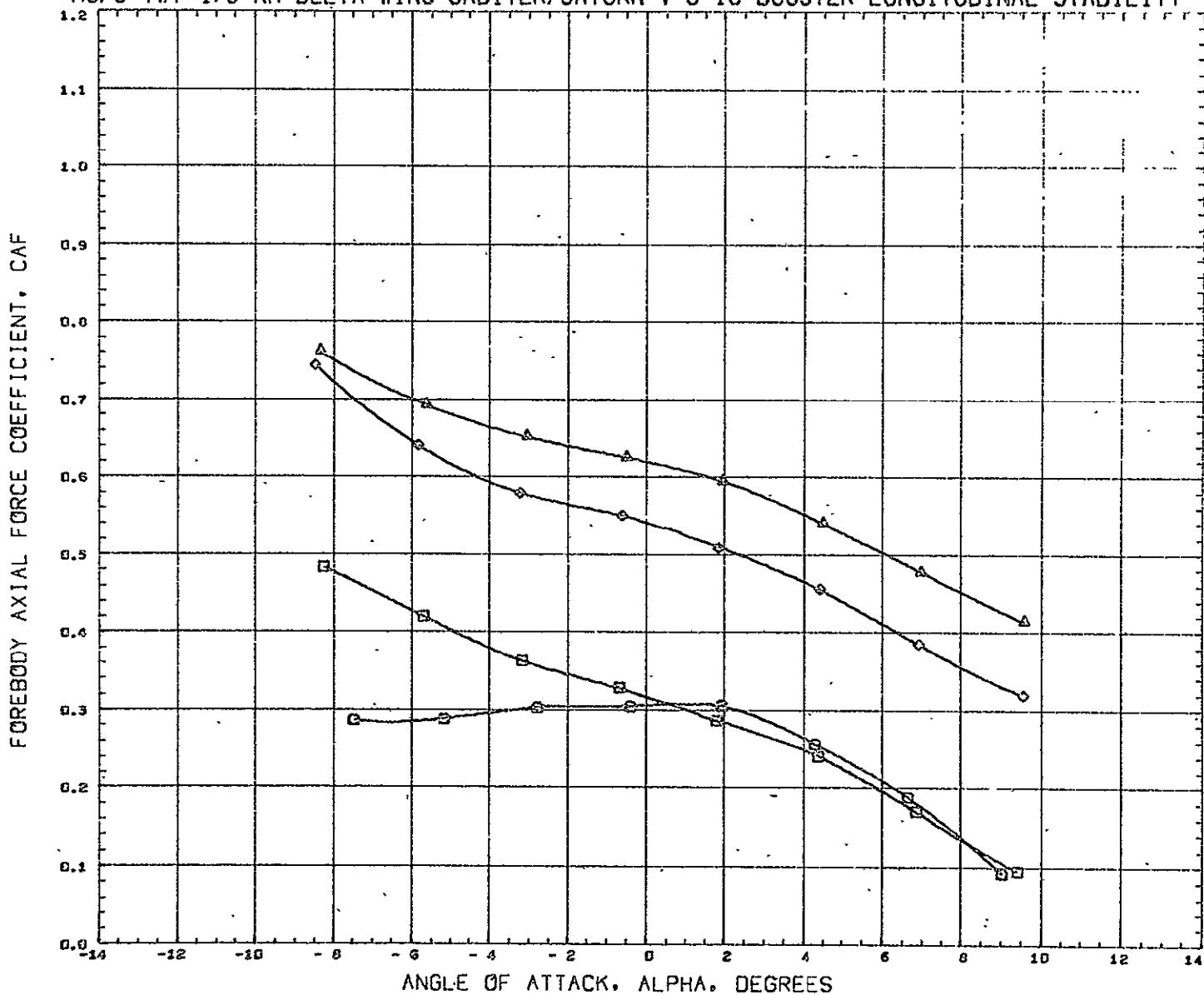
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	G.000	ORBINC
○	1.198		-	2.000
□	1.459			
◊	1.955			

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FFL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RPF	0.0000	INCHES
RP	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 64

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



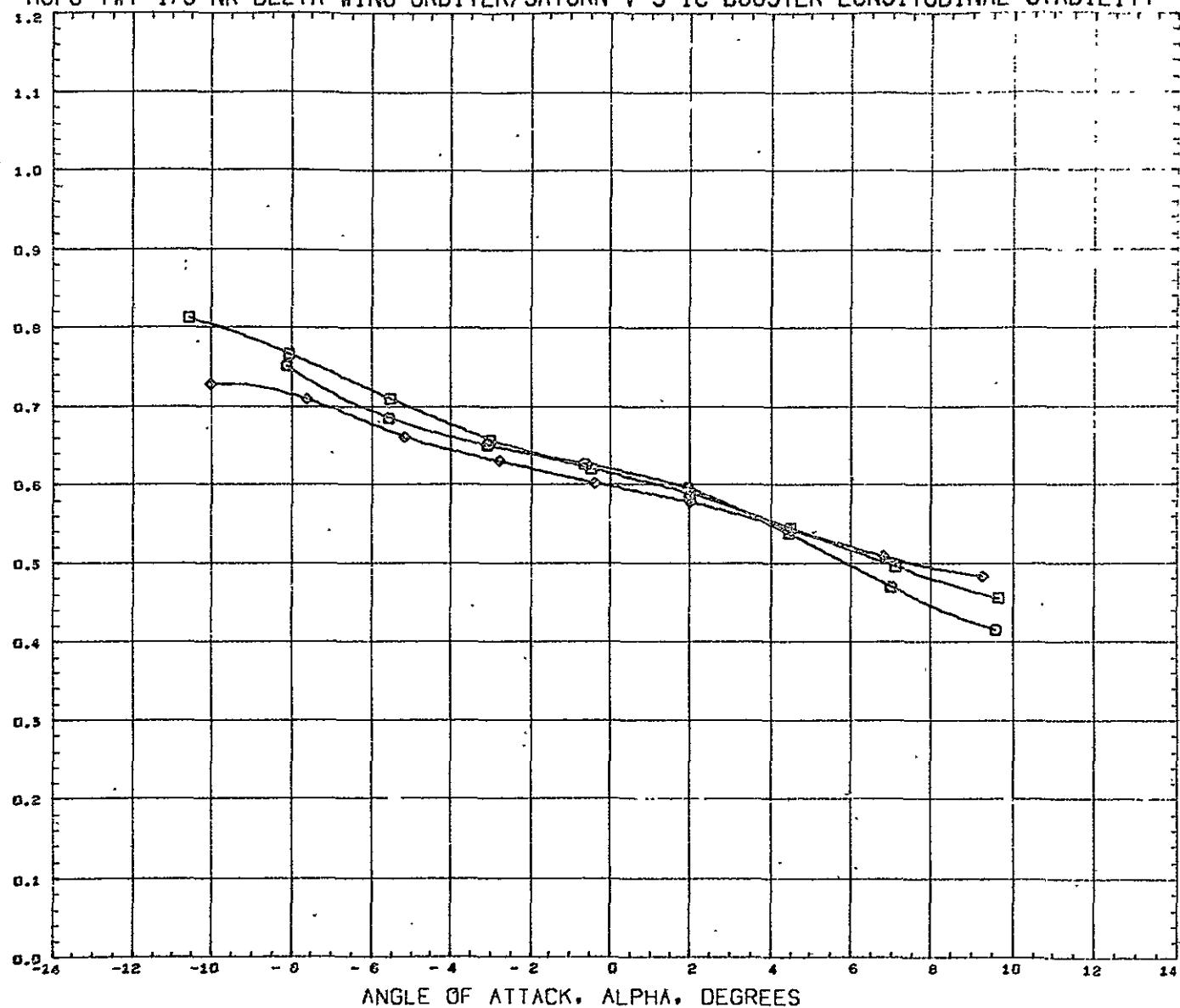
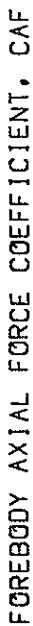
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	G,000	ORBINC - 2,000
○	0.660			
□	0.896			
◊	1.002			
△	1.101			

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REF8	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	O.000	ORBINC - 2,000
□	1.198			
□	1.459			
◊	1.955			

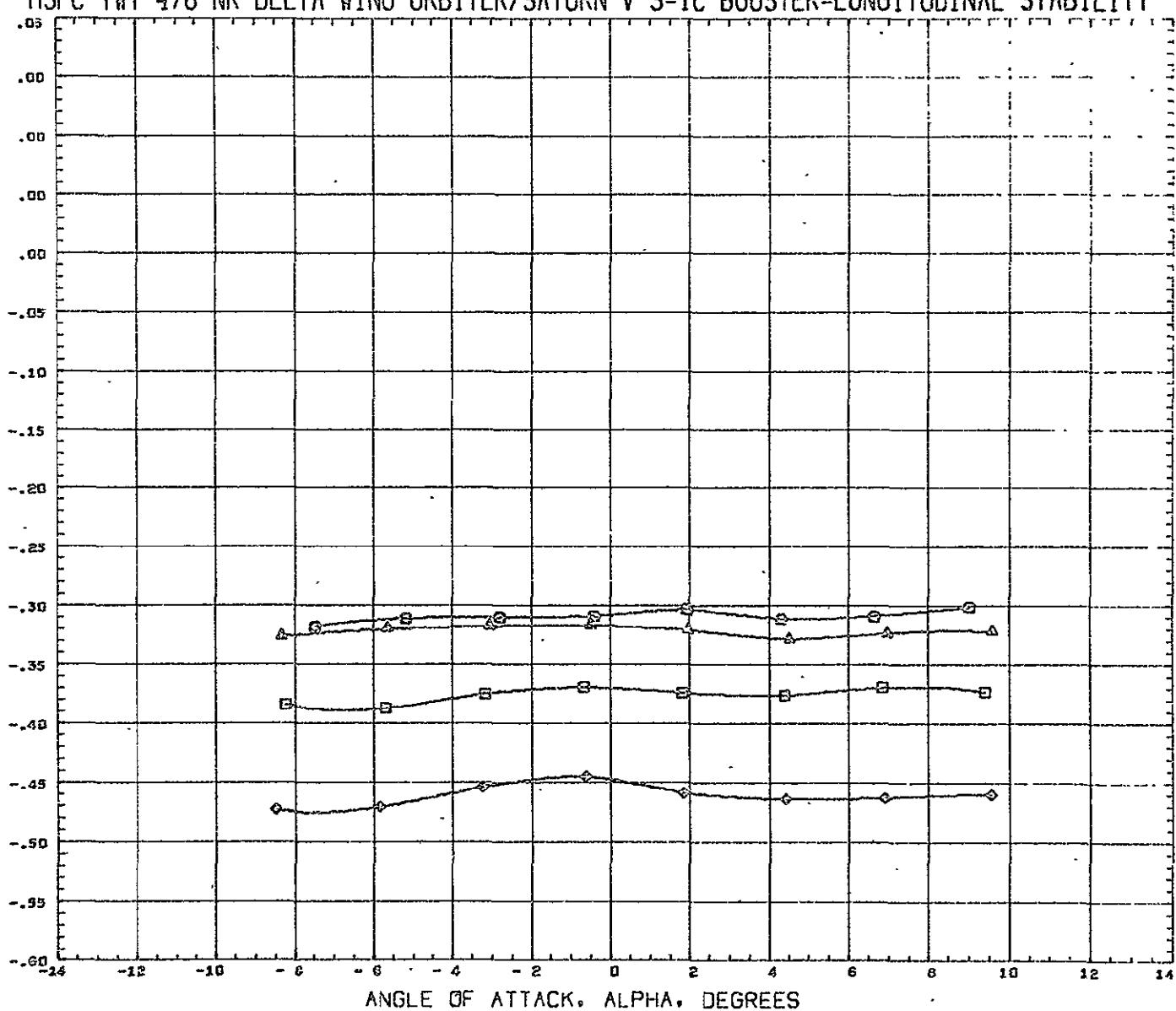
REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HNP	5.2640	INCHES
HRP	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 CR250813 14 JAN 71 PAGE 66

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB1



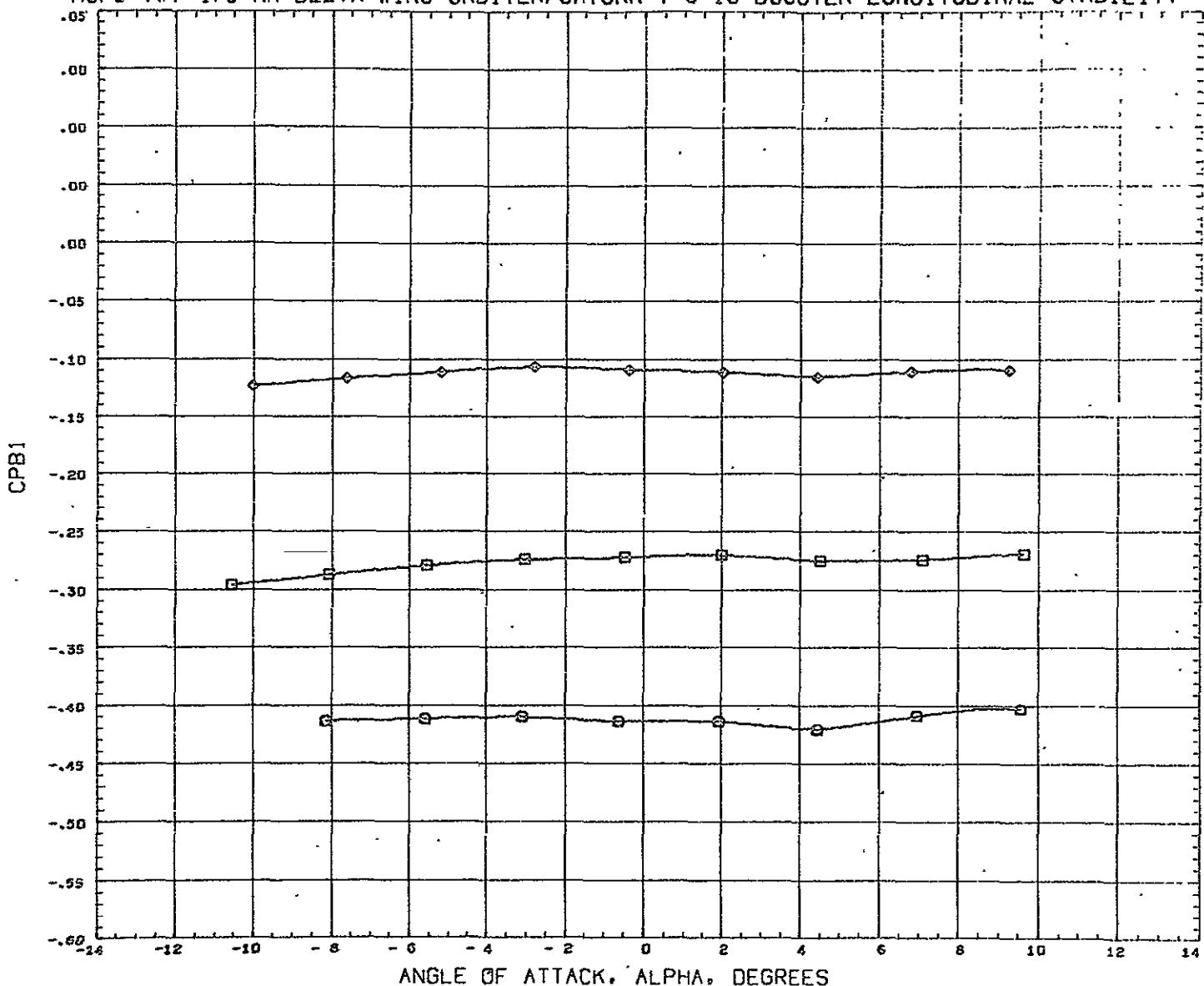
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.600		0.000 ORBINC - 2.000
□	0.896		
◊	1.002		
△	1.101		

DATA MIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRC	5.2640	INCHES
YHRC	0.0000	INCHES
ZHRC	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



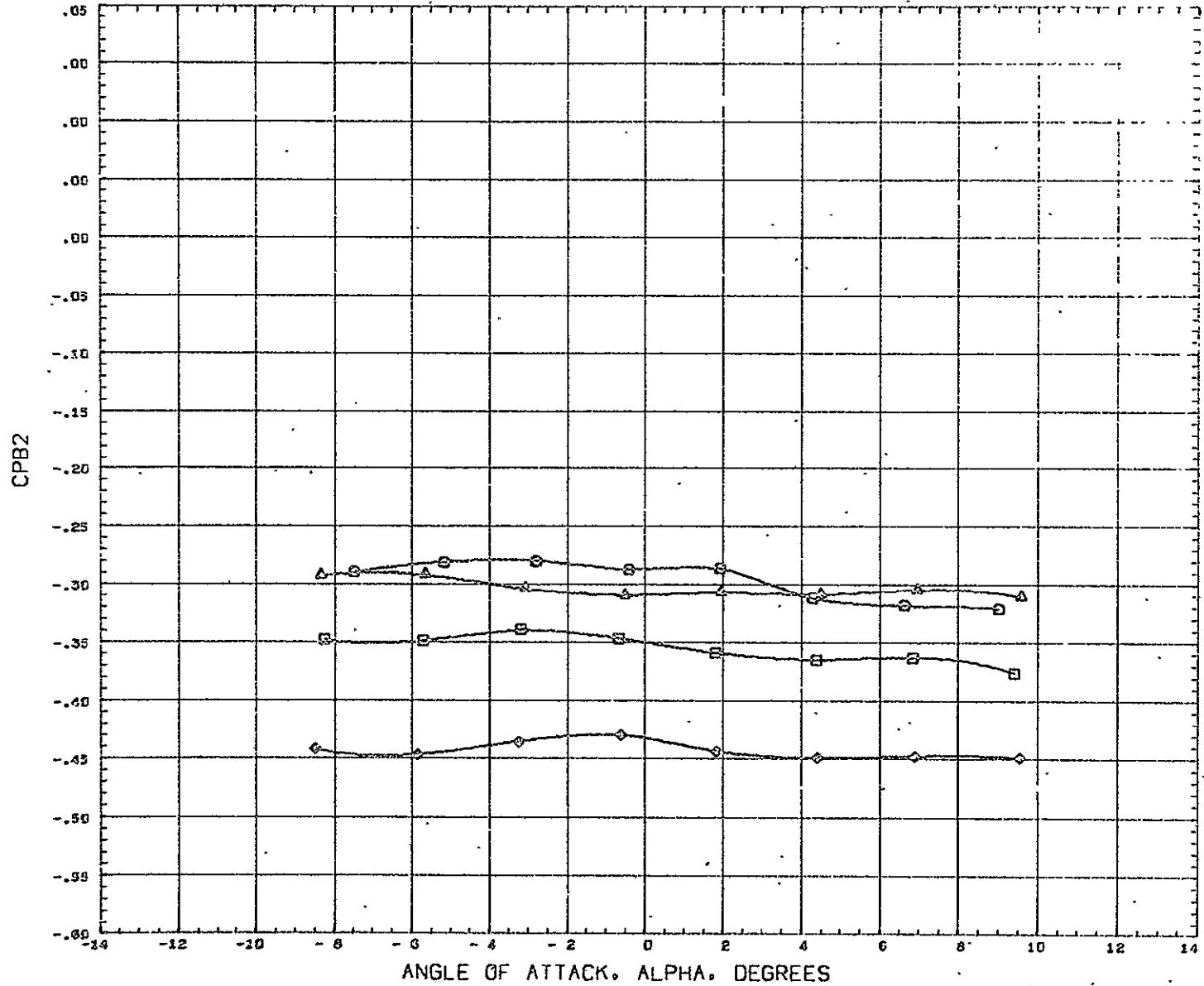
SYMBOL	HACH	PARAMETRIC VALUES
□	1.198	BETA 0.000 ORBINC - 2.000
□	1.459	
◊	1.955	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRF	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00GSTER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 68

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



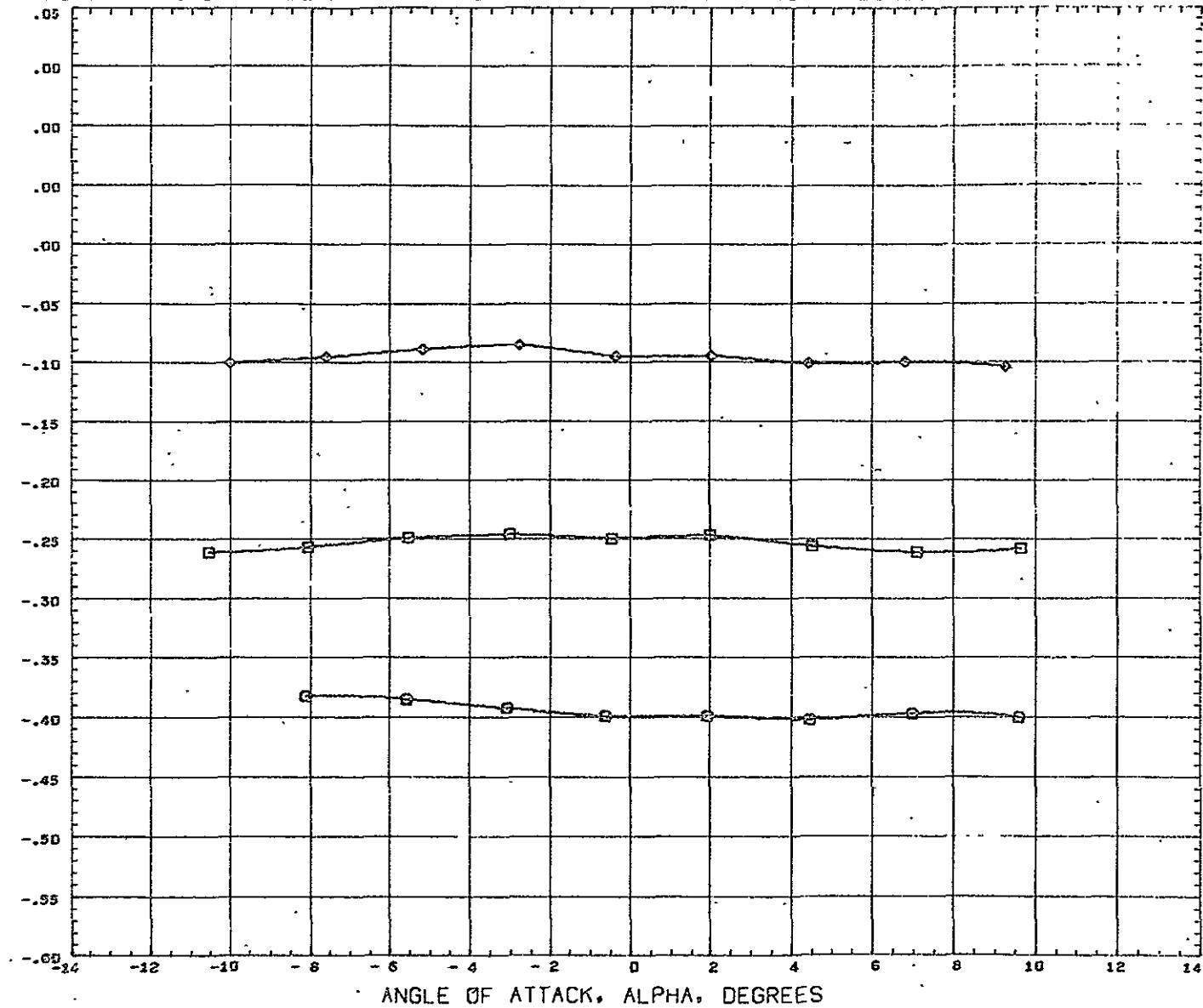
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	G.000	ORBINC - 2.000
○	0.600			
□	0.895			
◊	1.002			
△	1.101			

DATA HIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 69

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



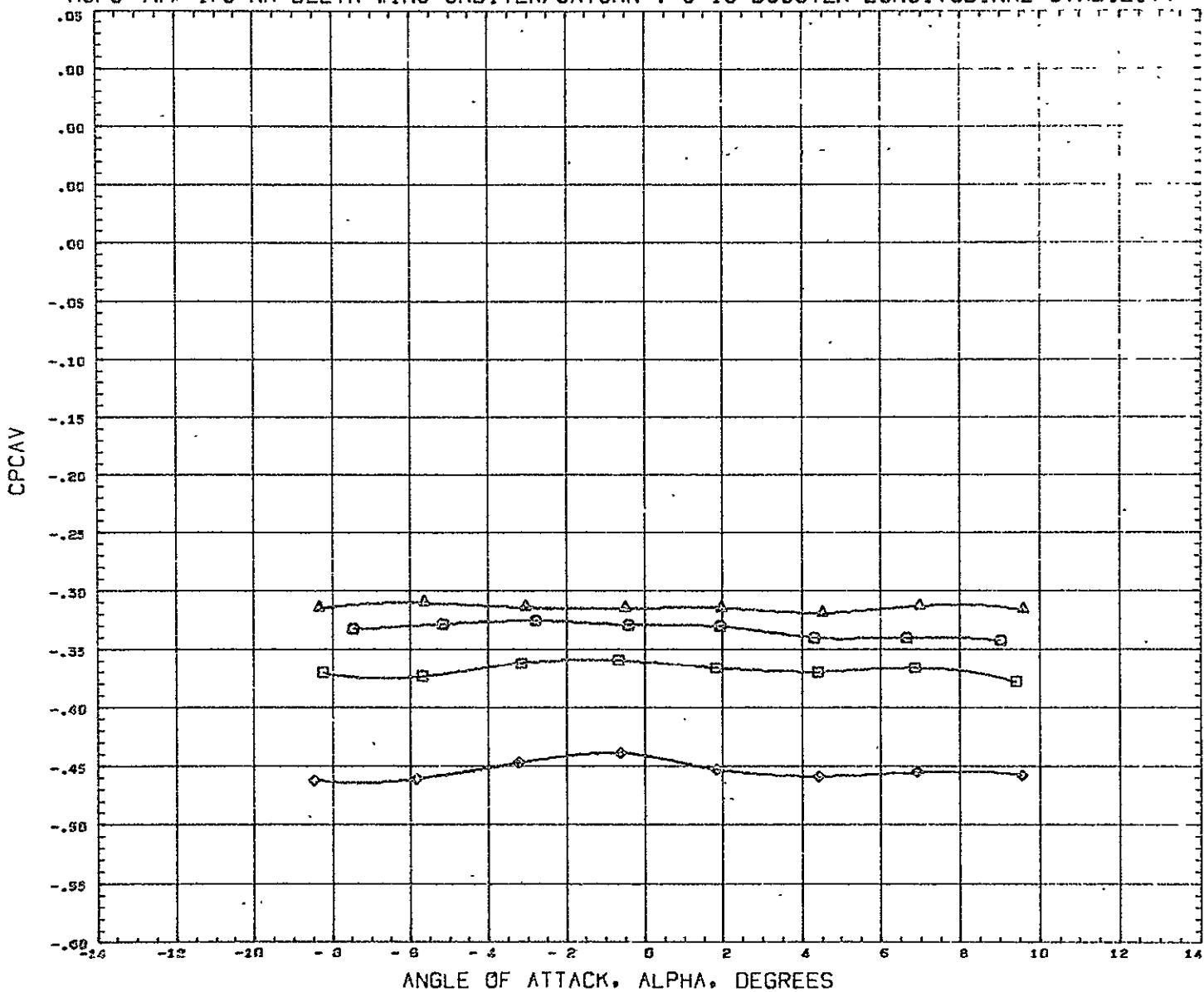
SYMBOL	MACH	BETA	PARAMETRIC VALUES		
□	1.198		0.600	ORBINC	- 2.000
□	1.459				
◊	1.955				

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
HRF	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB005TER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 70

MSFC TWT 476 NR 'DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

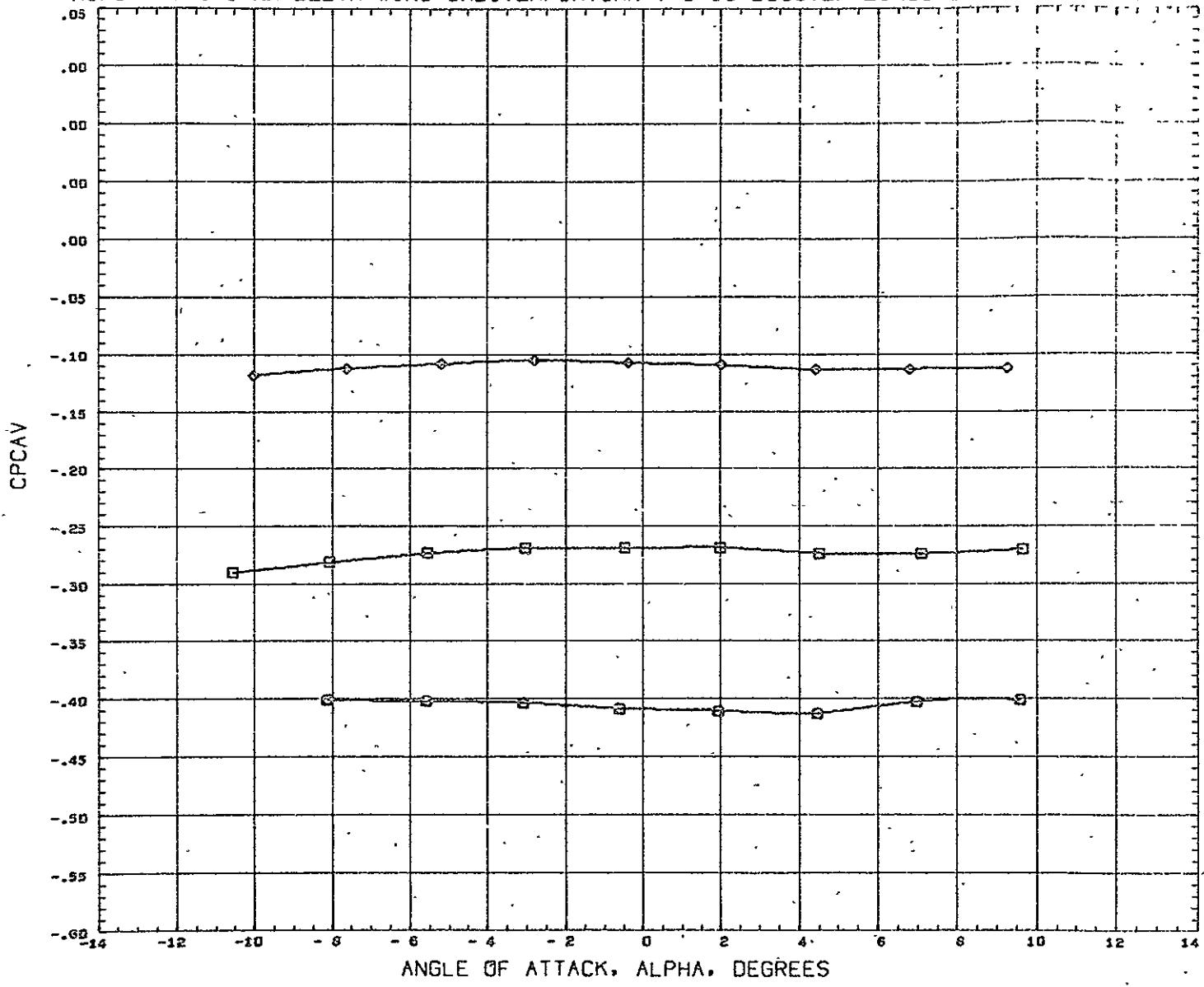


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	O,000	ORBINC - 2,000
□	0.600			
□	0.896			
◊	1.002			
△	1.101			

DATA HIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



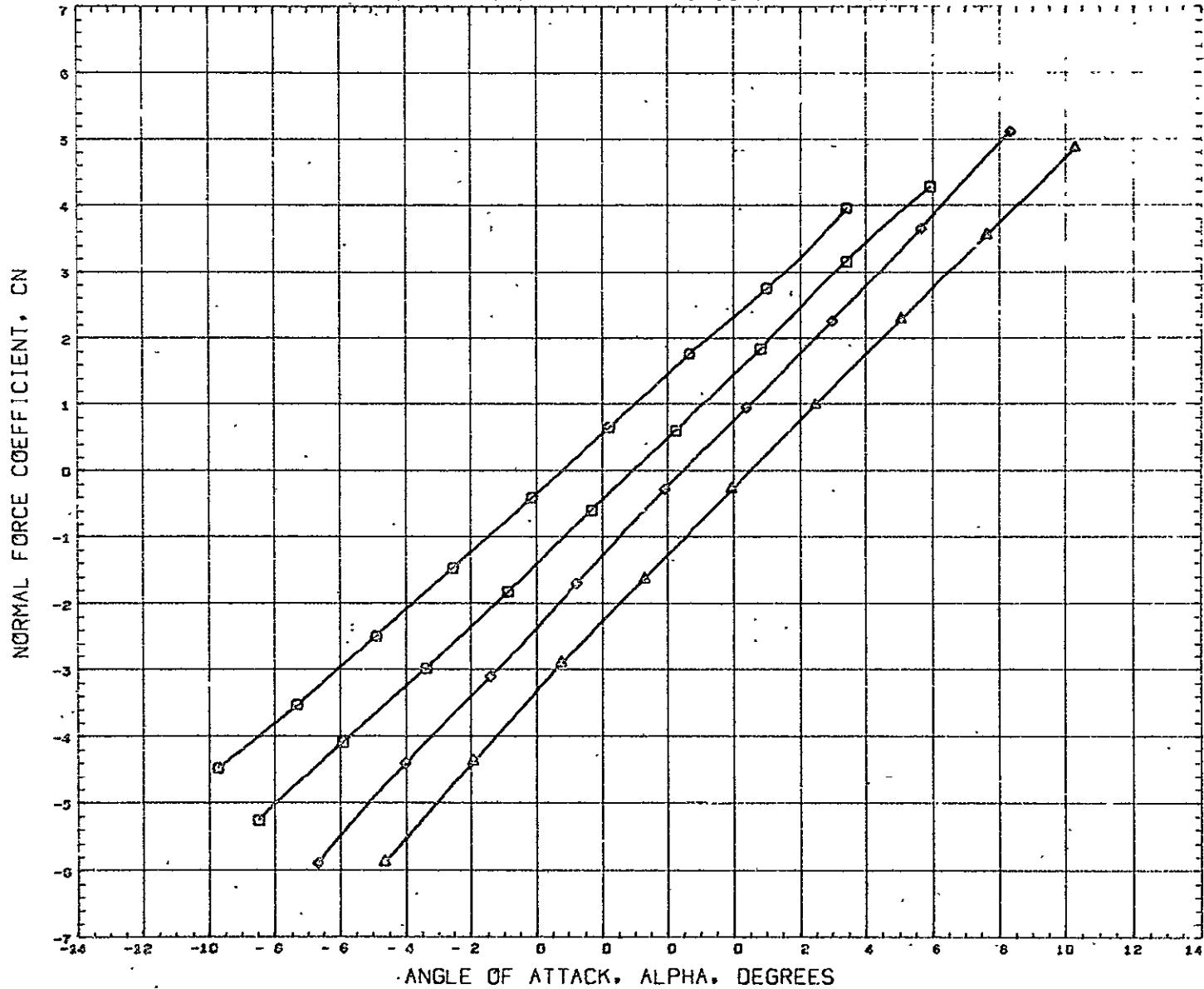
SYMBOL	NACH	PARAMETRIC VALUES		
		BETA	D.000	ORBINC
□	1.198		0.000	2.000
□	1.459			
◊	1.955			

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
FL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RP	0.0000	INCHES
RF	0.0330	INCHES
ALE	0.0034	

DATA HIST. CODE HH

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 72

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

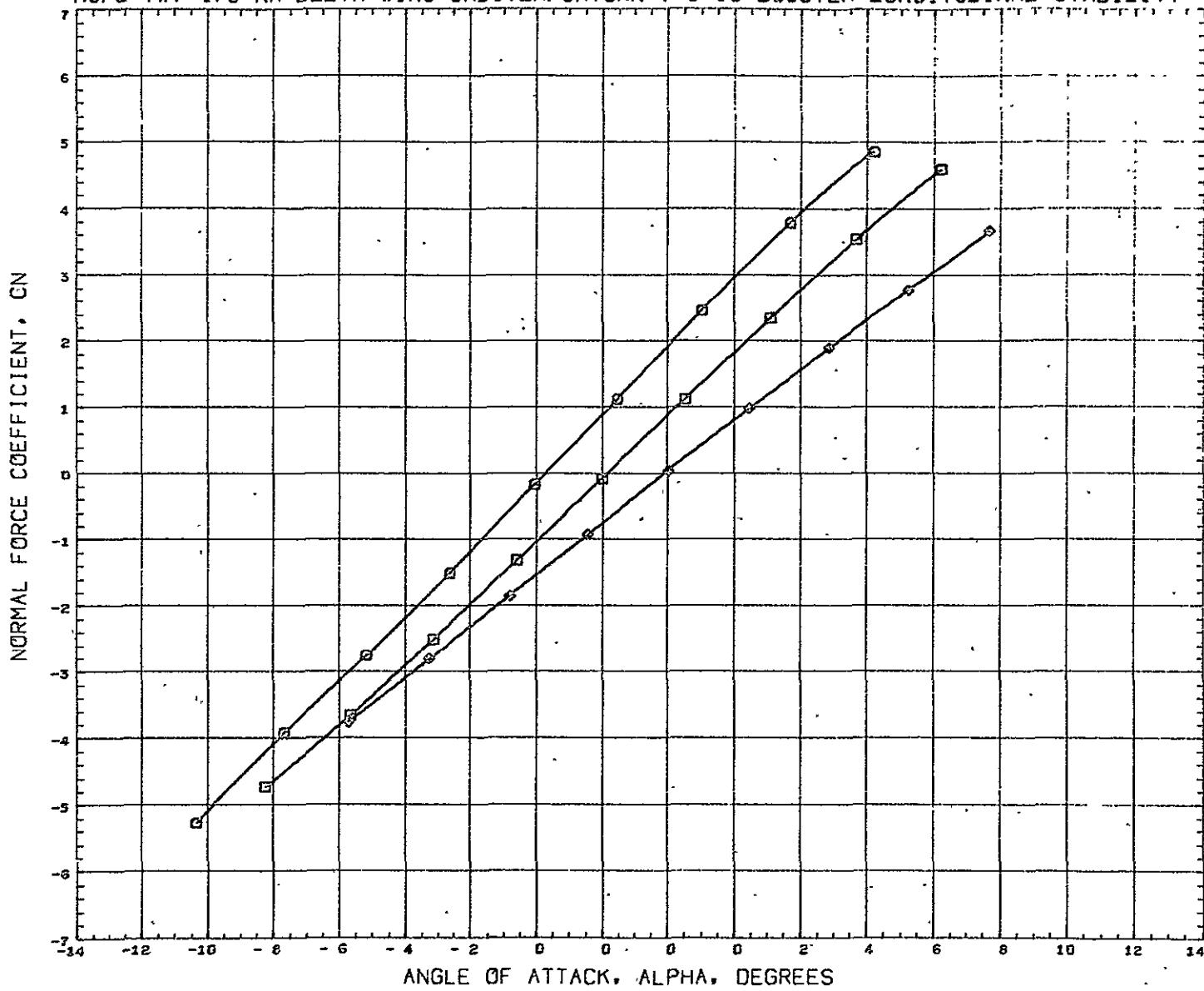


SYMBOL	NACH	PARAMETRIC VALUES		
		BETA	0.000	ORBINC
○	0.601			1.000
□	0.698			
◊	0.997			
△	1.098			

DATA MIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	O.000	ORBINC
□	1.194			1.000
□	1.461			
◊	1.960			

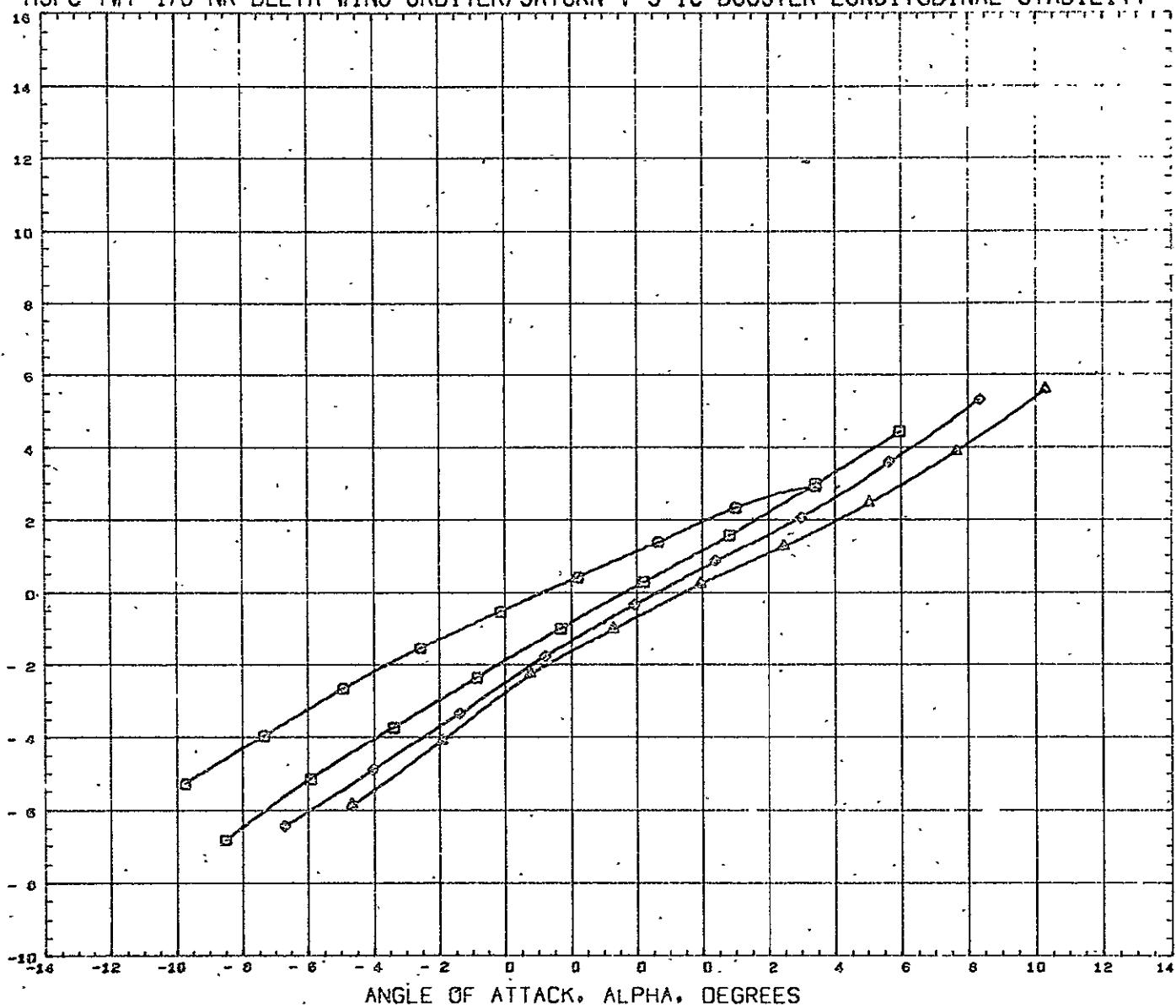
REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRF	5.2640	INCHES
YHMRF	0.0000	INCHES
ZHMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 [R25091] 08 JAN 71 PAGE 74

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM

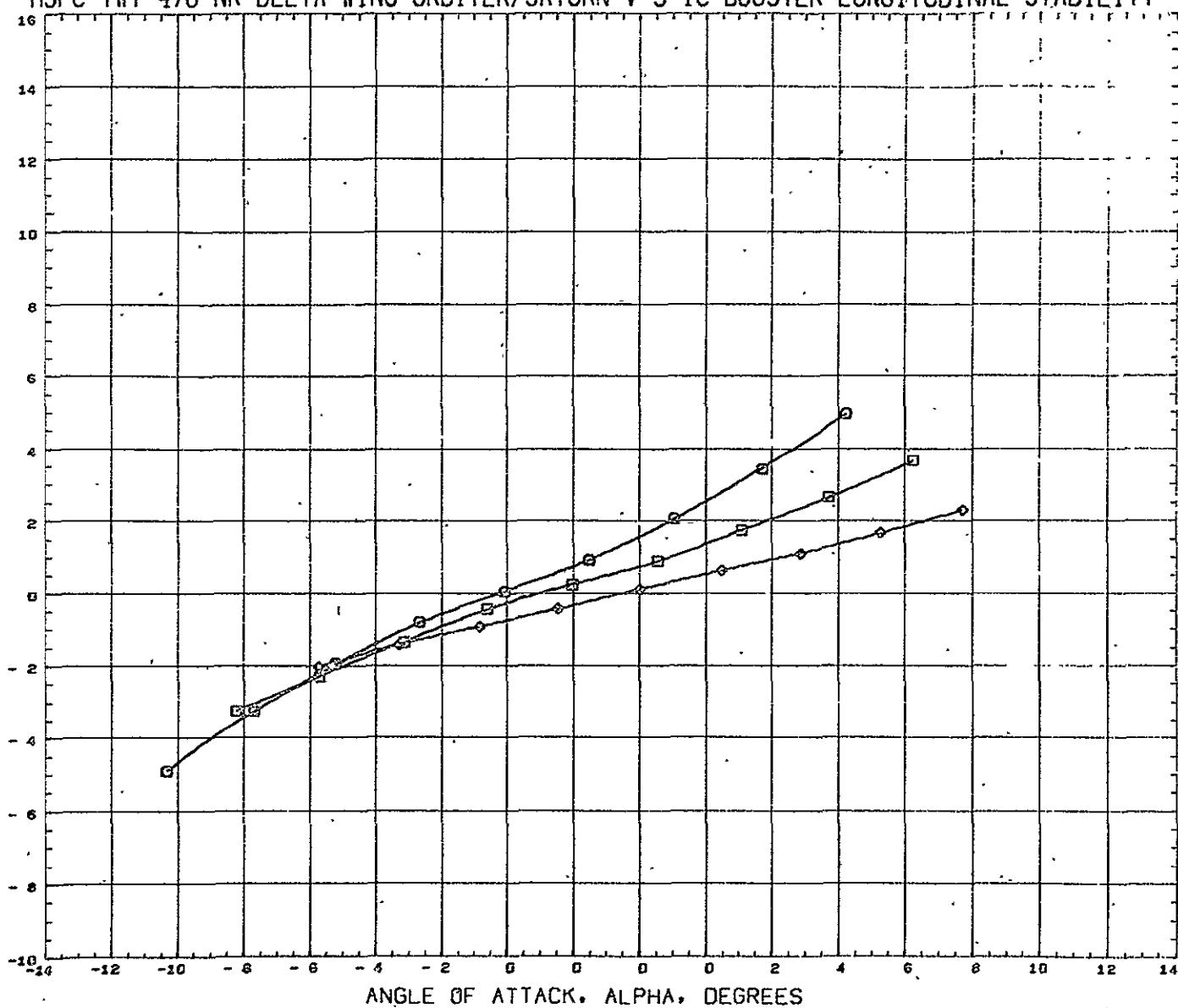
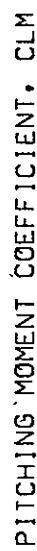


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.601 BETA 0.000 ORBINC 1.000
 □ 0.898
 ◇ 0.997
 △ 1.098

DATA MIST. CODE HH

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRP 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	O.000	ORBINC
□	1.194			1.000
□	1.461			
◊	1.960			

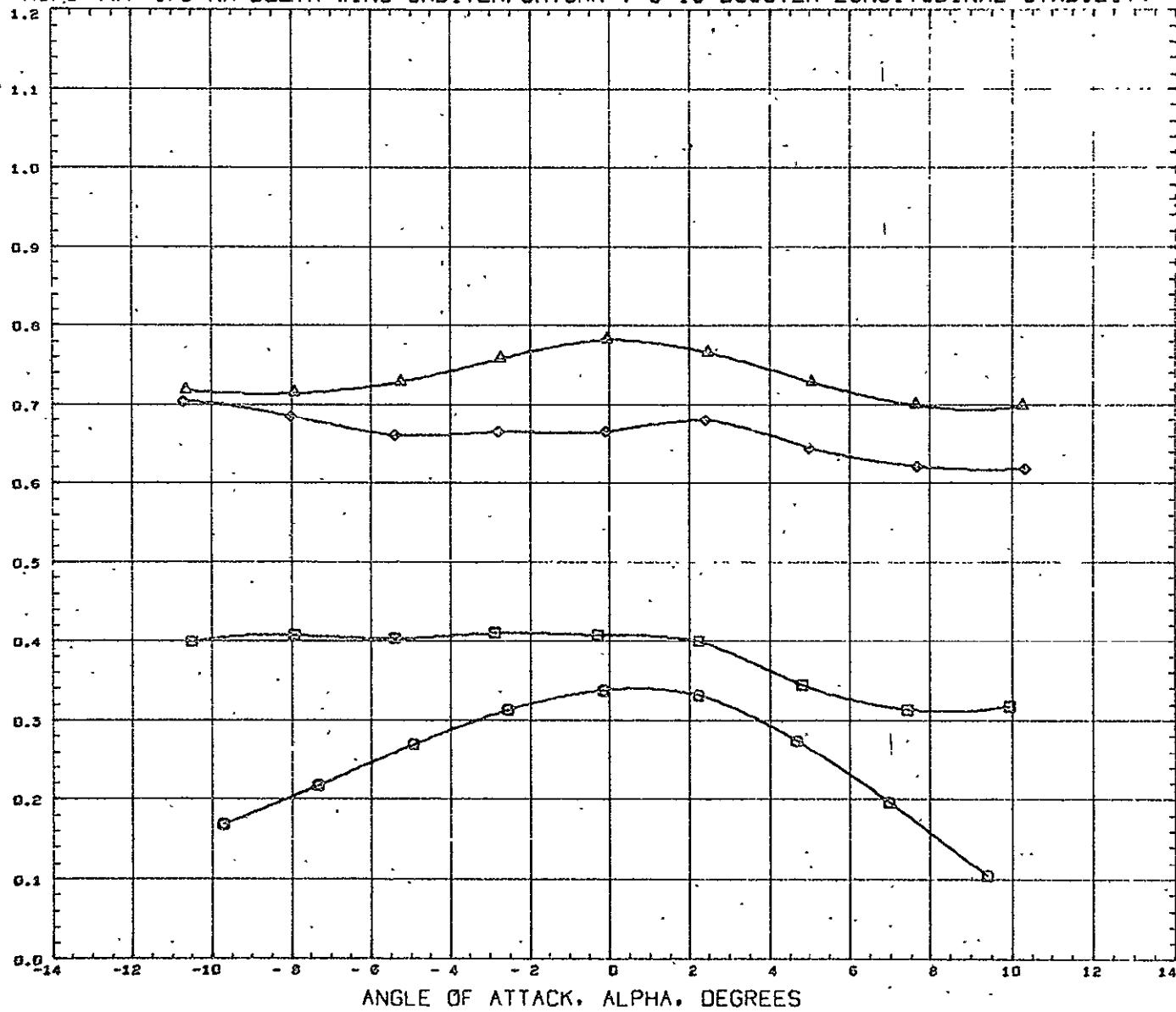
REFERENCE INFORMATION		
EFS	1.3960	SQ.IN.
EFL	1.3330	INCHES
FB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 76

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



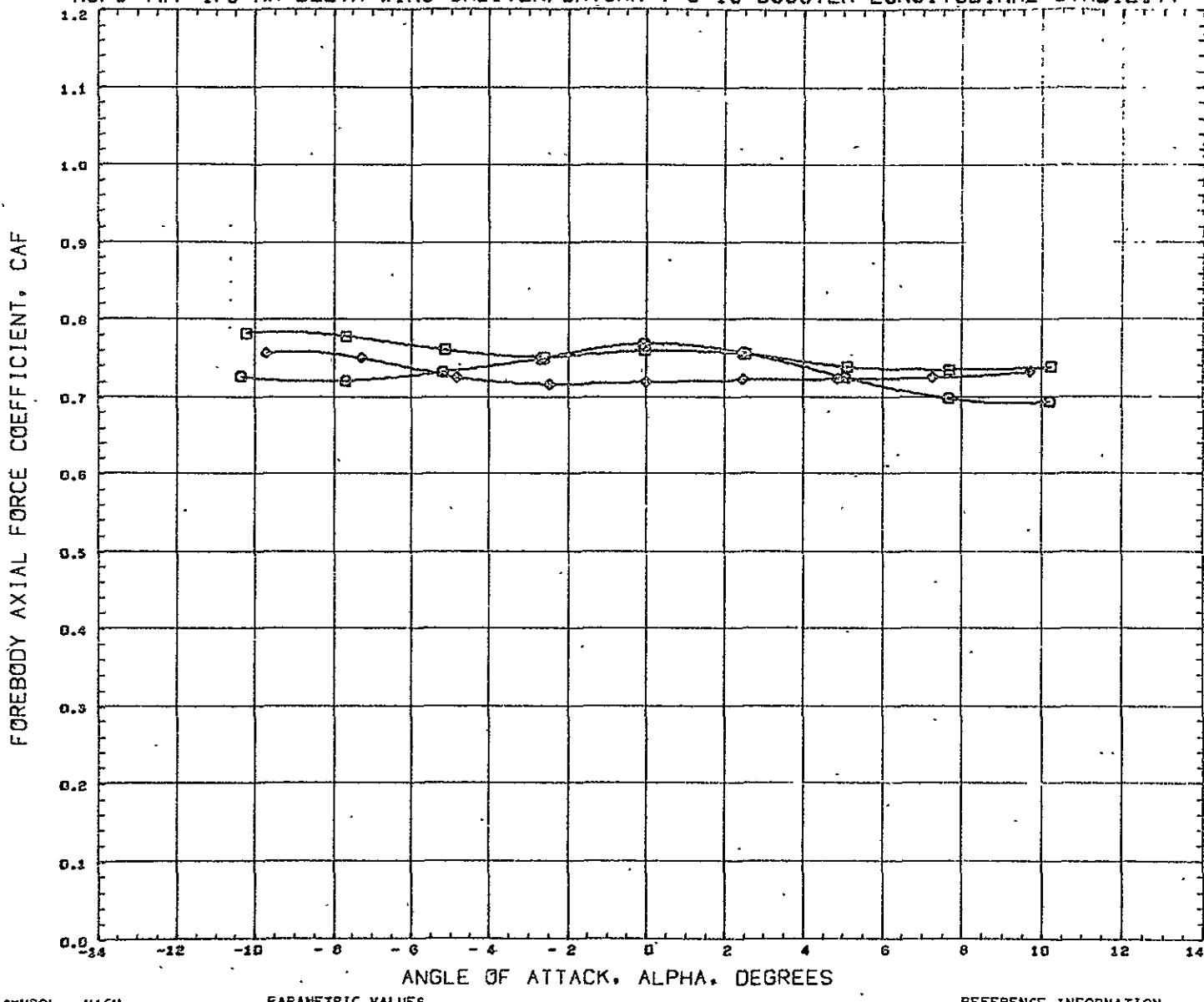
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL	HACH.	PARAMETRIC VALUES		
		BETA	0.000	ORBINC
○	0.601			1.000
□	0.098			
◊	0.997			
△	1.098			

DATA MIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



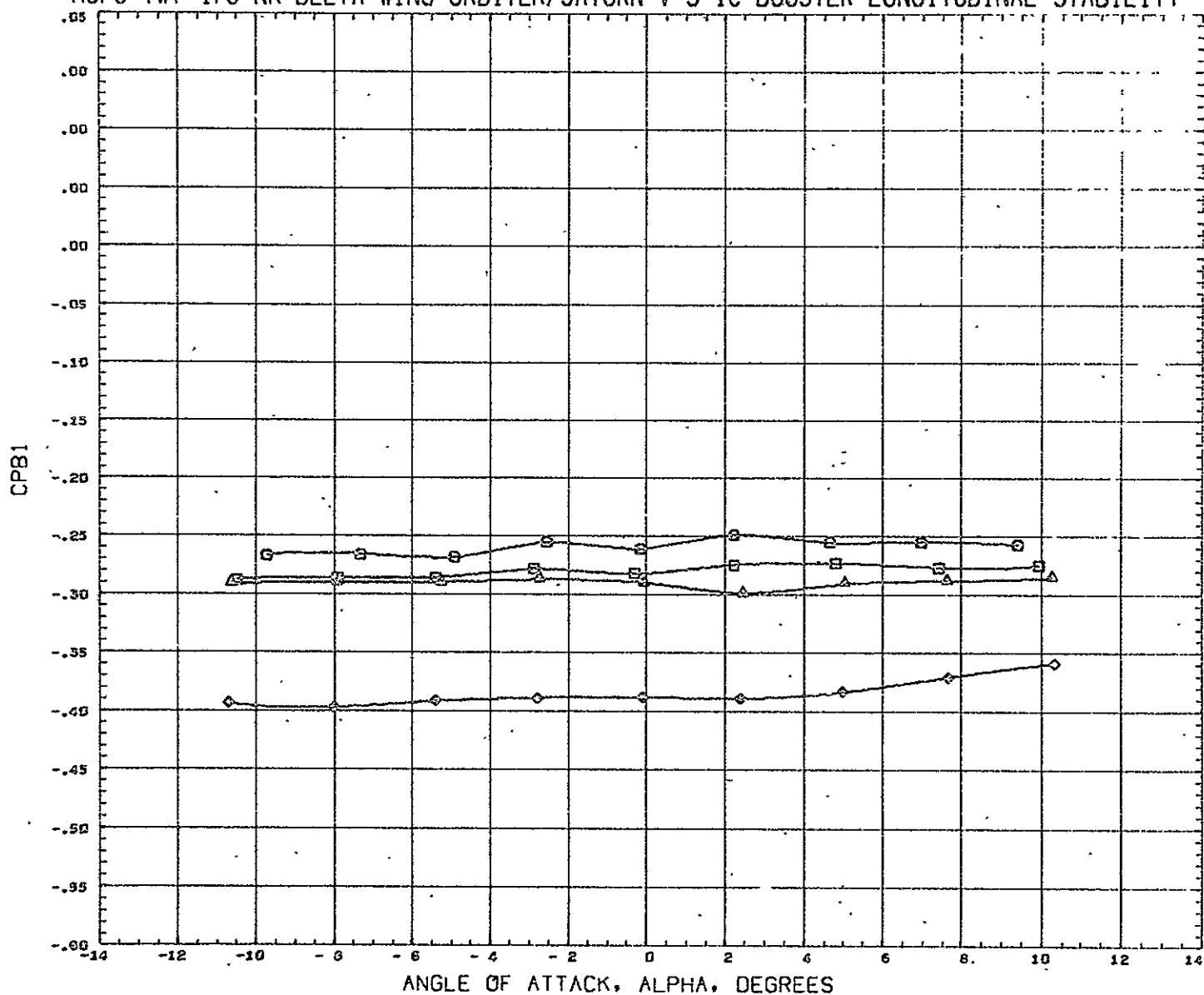
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	O,000	ORBINC
○	1,194		0,000	1,000
□	1,451			
◊	1,966			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 78

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

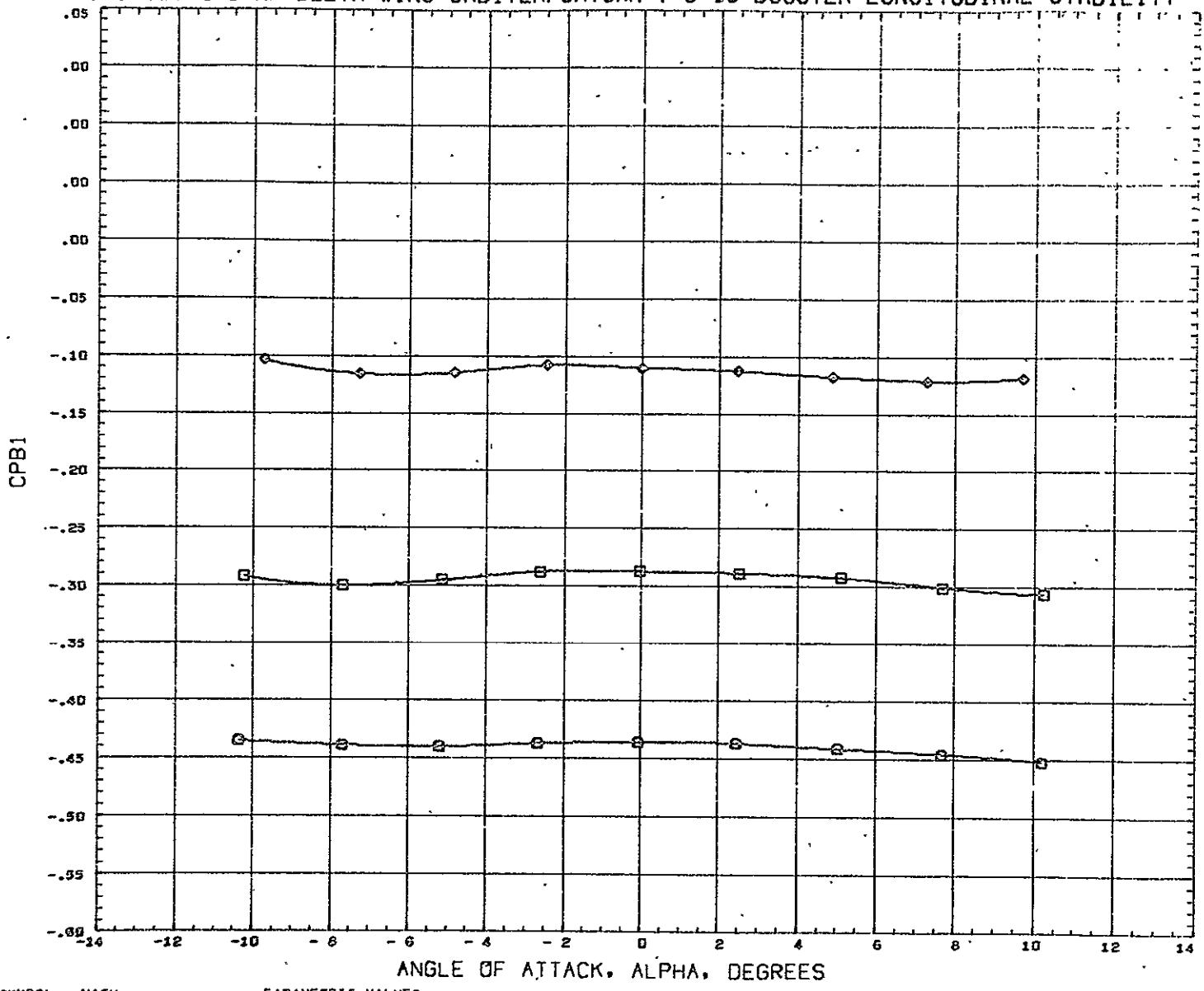


SYMBOL MACH PARAMETRIC VALUES
 O 0.601 BETA 0.000 ORBINC 1.000
 □ 0.898
 ◊ 0.997
 Δ 1.098

DATA MIST. CODE NH

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.GOB	ORBINC
□	1.194		0.600	1.000
□	1.461			
◊	1.960			

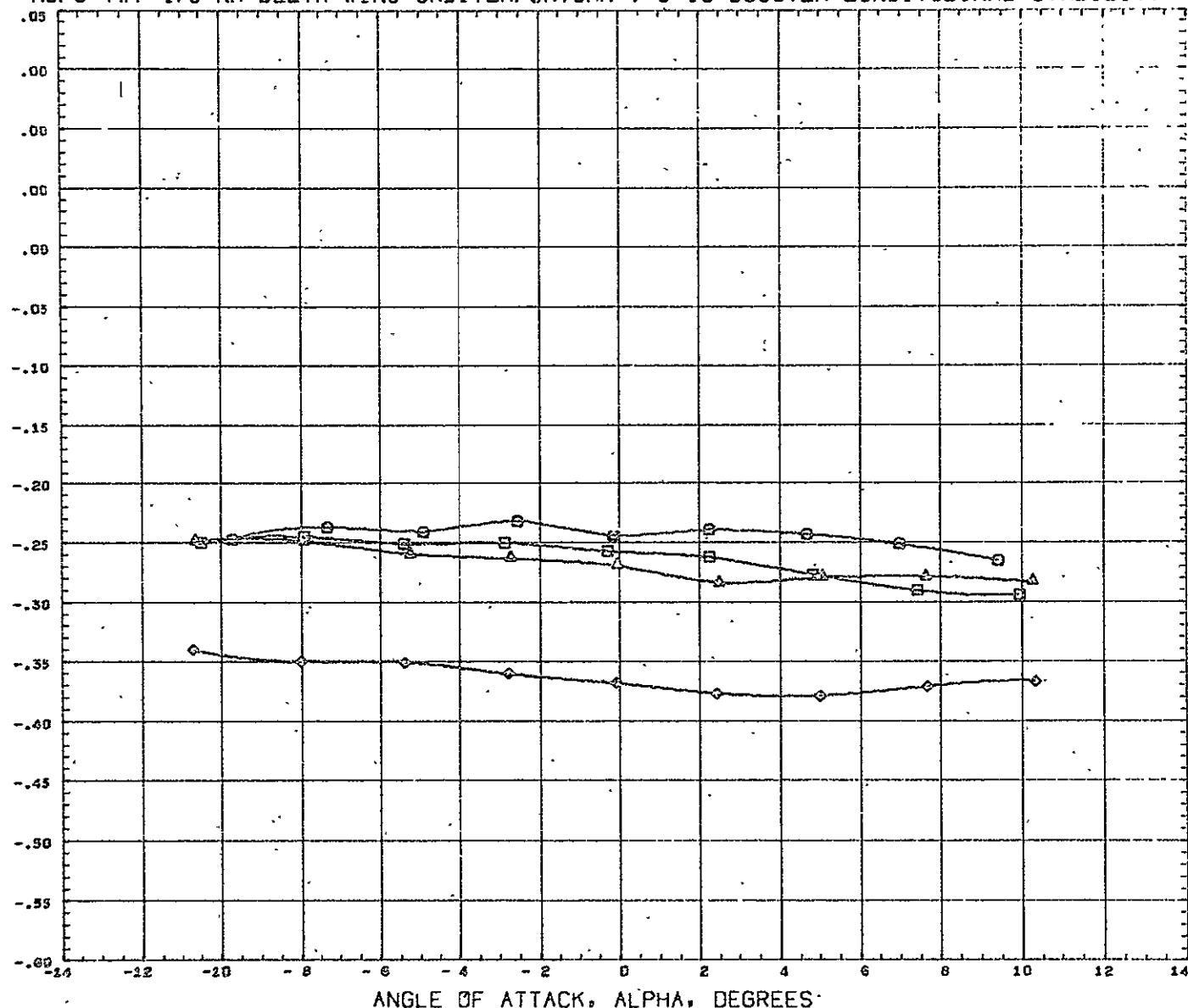
DATA HIST. CODE MM

REFERENCE INFORMATION		
SFS	1.3960	SQ.IN.
SFL	1.3330	INCHES
SFB	1.3330	INCHES
HRF	5.2640	. INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	INCHES

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 80

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

CPB2



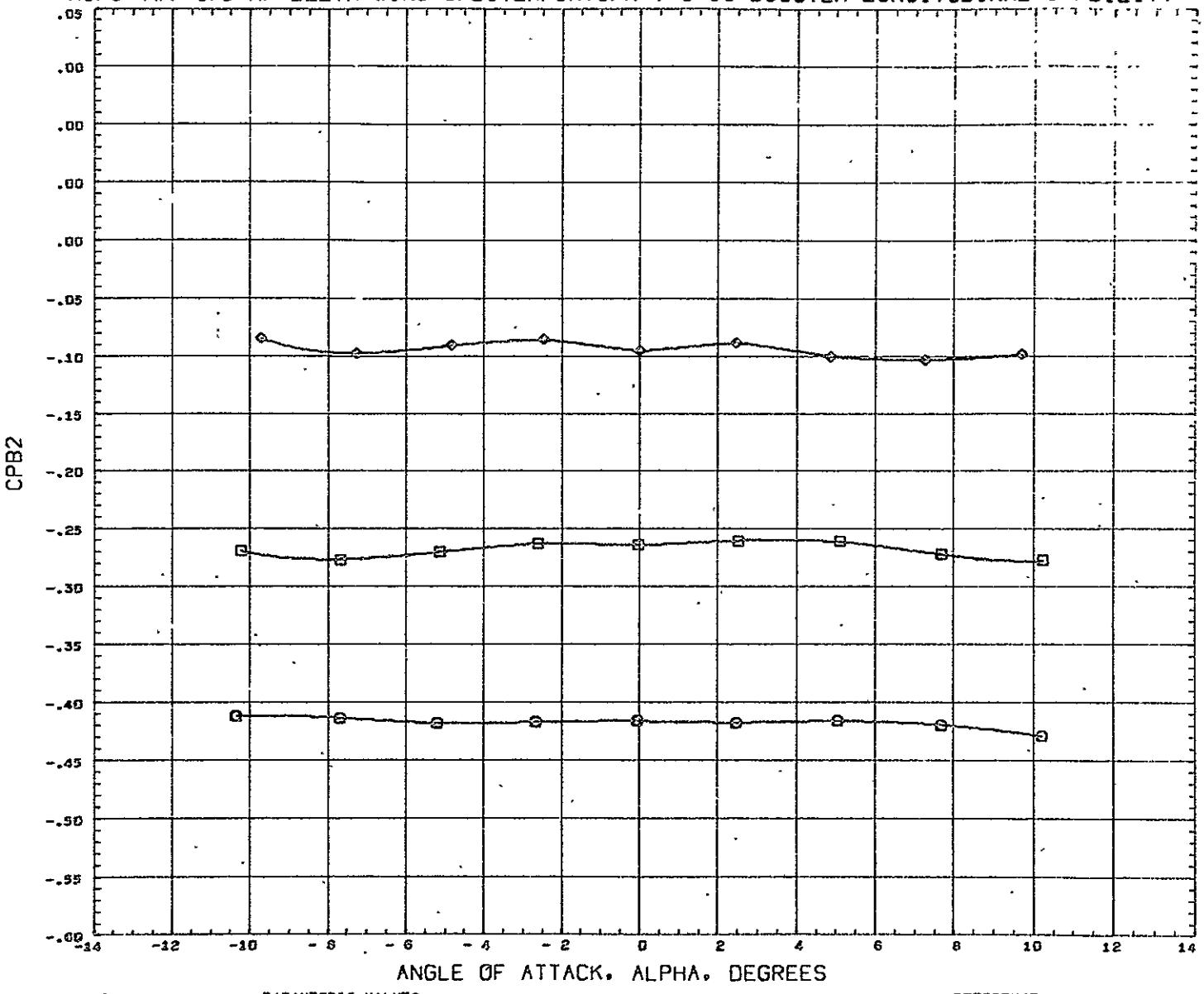
ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL HACH PARAMETRIC VALUES
 ○ 0.601 BETA 0.000 ORBINC 1.000
 □ 0.692
 ◊ 0.997
 △ 1.098

DATA HIST: CODE HH

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZMRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



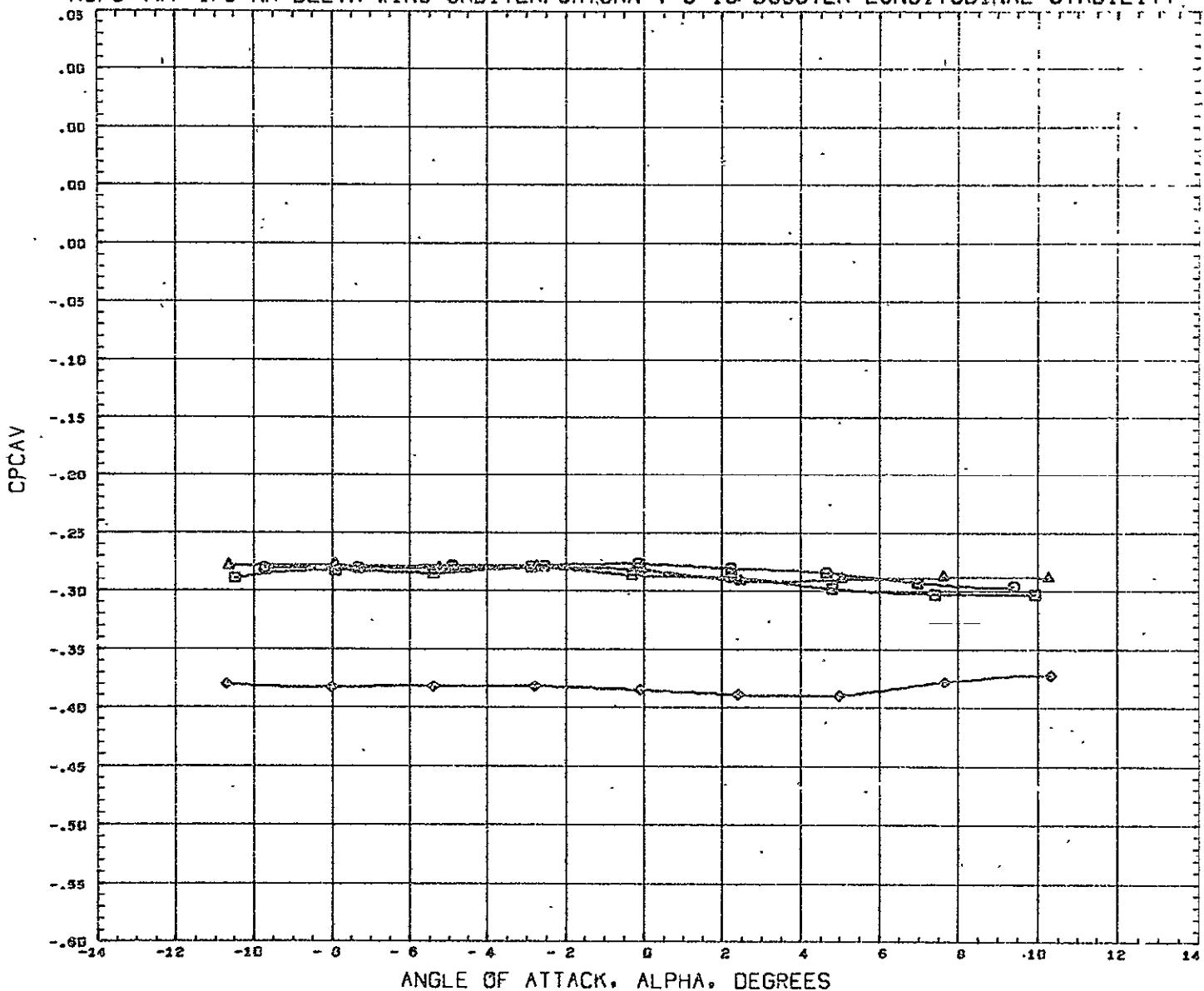
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.000	ORBINC
○	1.194			1.000
□	1.451			
◊	1.960			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 (R25091) 08 JAN 71 . PAGE 82

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY.

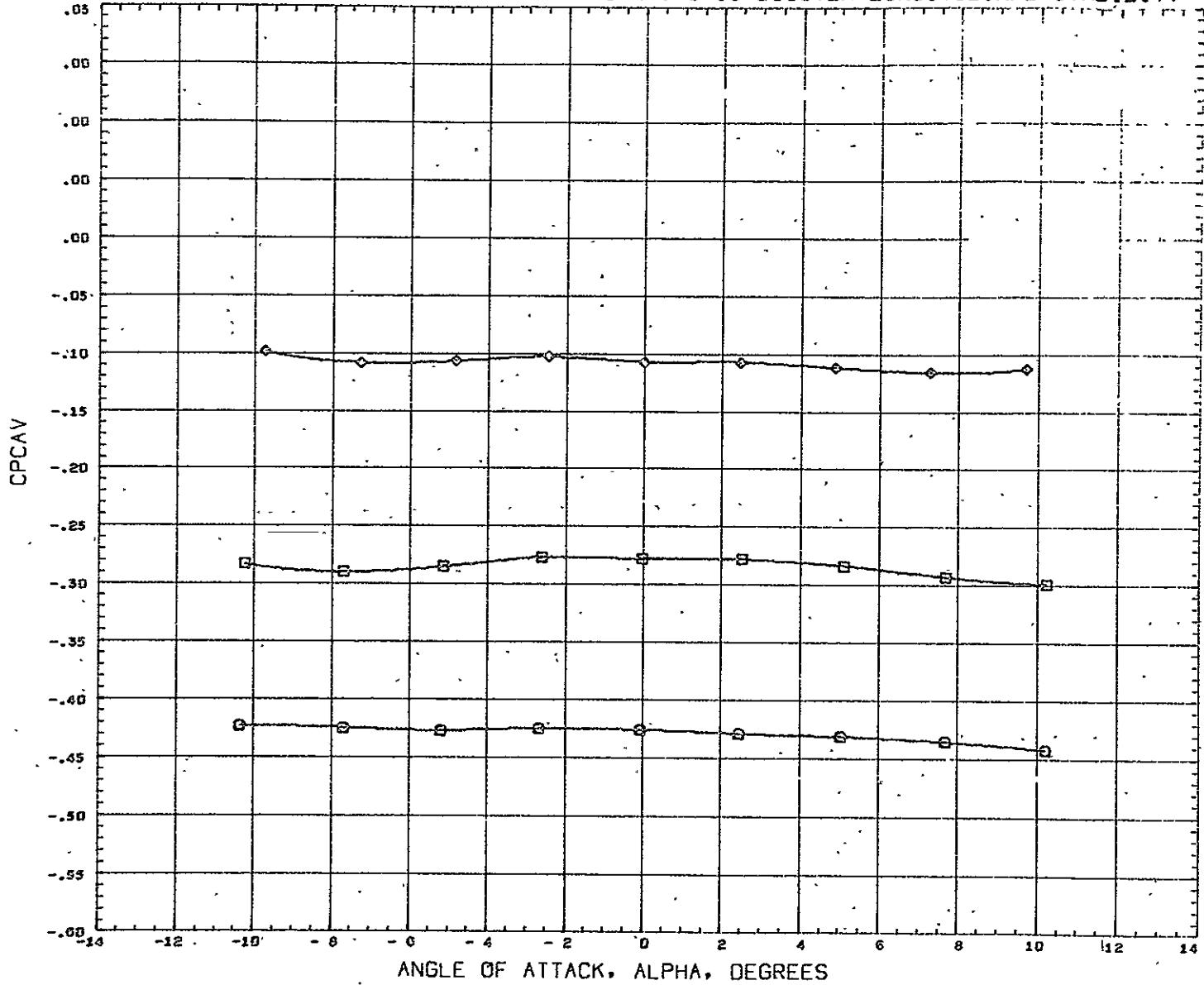


SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.000	ORBINC
O	0.601			1.000
□	0.898			
◊	0.997			
△	1.098			

REFERENCE INFORMATION		
CFS	1.3960	SQ.IN.
CFL	1.3330	INCHES
CFB	1.3330	INCHES
IRP	5.2660	INCHES
IRP	0.0000	INCHES
IRP	0.0330	INCHES
CALE	0.0034	.

DATA HIST. CODE MM

~~MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY~~



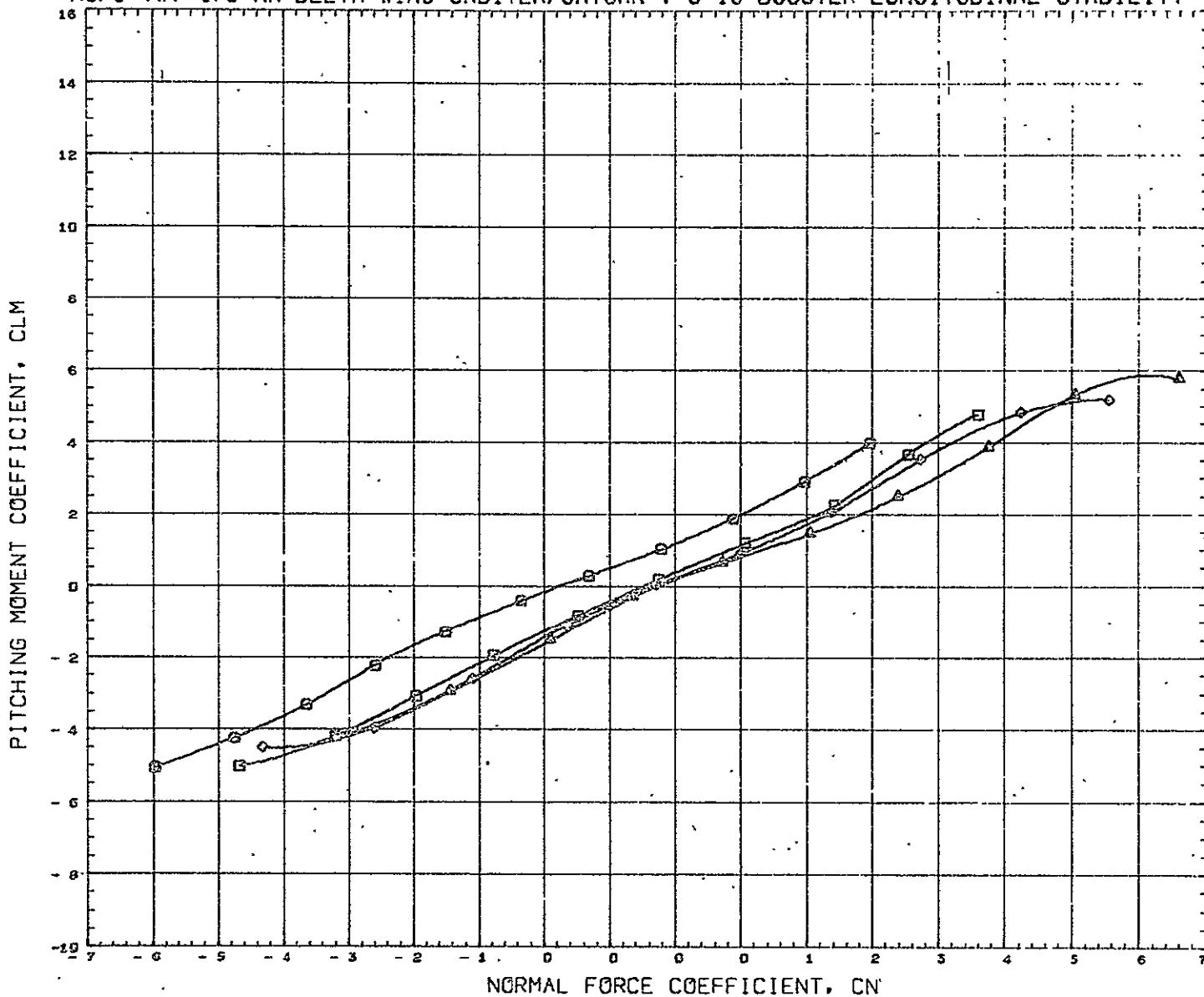
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	D.000	ORBINC
○	1.194			1.000
□	1.461			
◊	1.960			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE NH

MSFC 476 NR HCR0RB/S-1CB00STER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 84

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



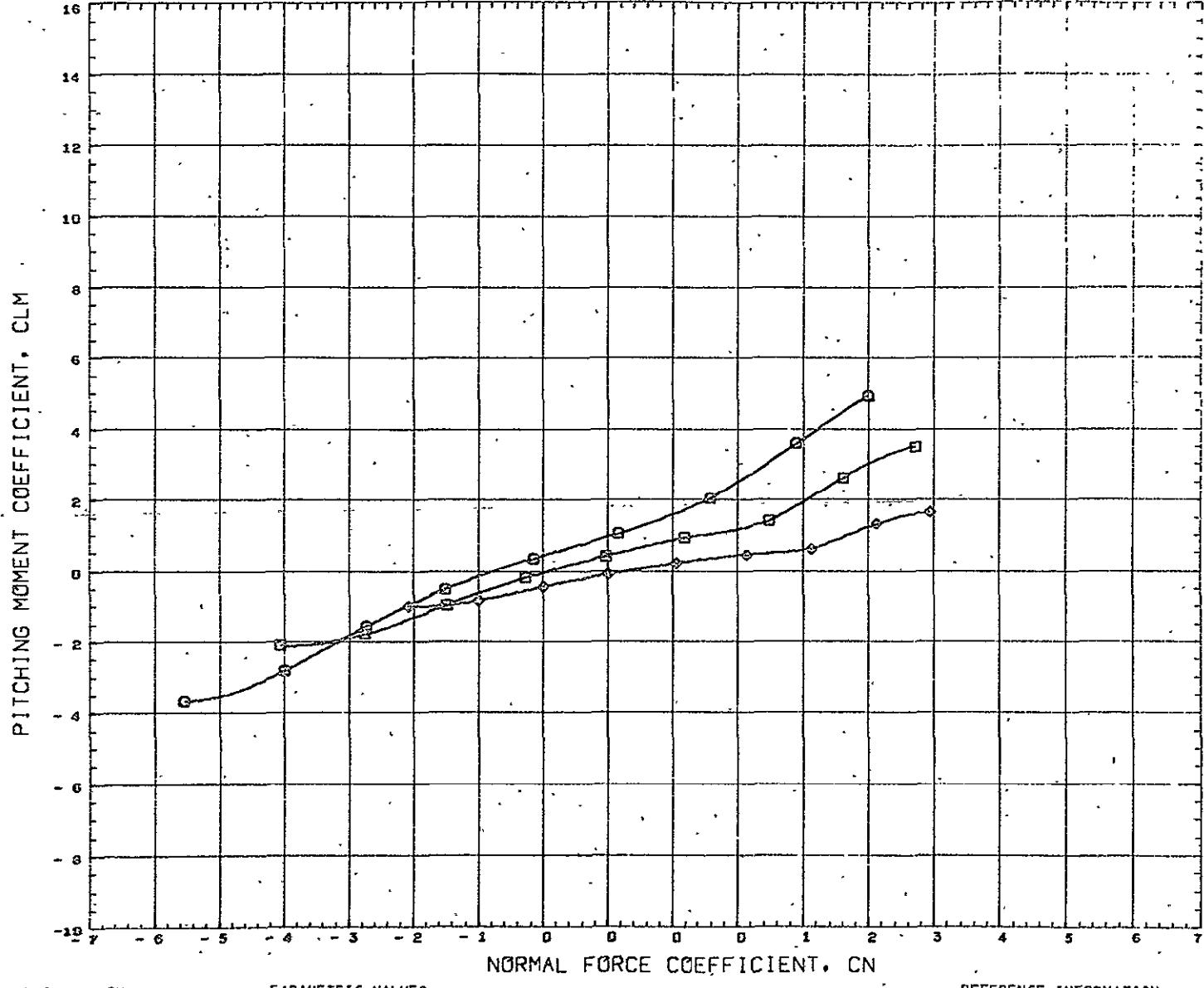
SYMBOL	MACH		PARAMETRIC VALUES
○	0.600	BETA	0.020 ORBINC
□	0.698		
◊	0.994		
△	1.108		

1,000

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	NAME	PARAMETRIC VALUES		
		BETA	0.020	ORBINC
□	1.198			1.000
□	1.465			
◊	1.952			

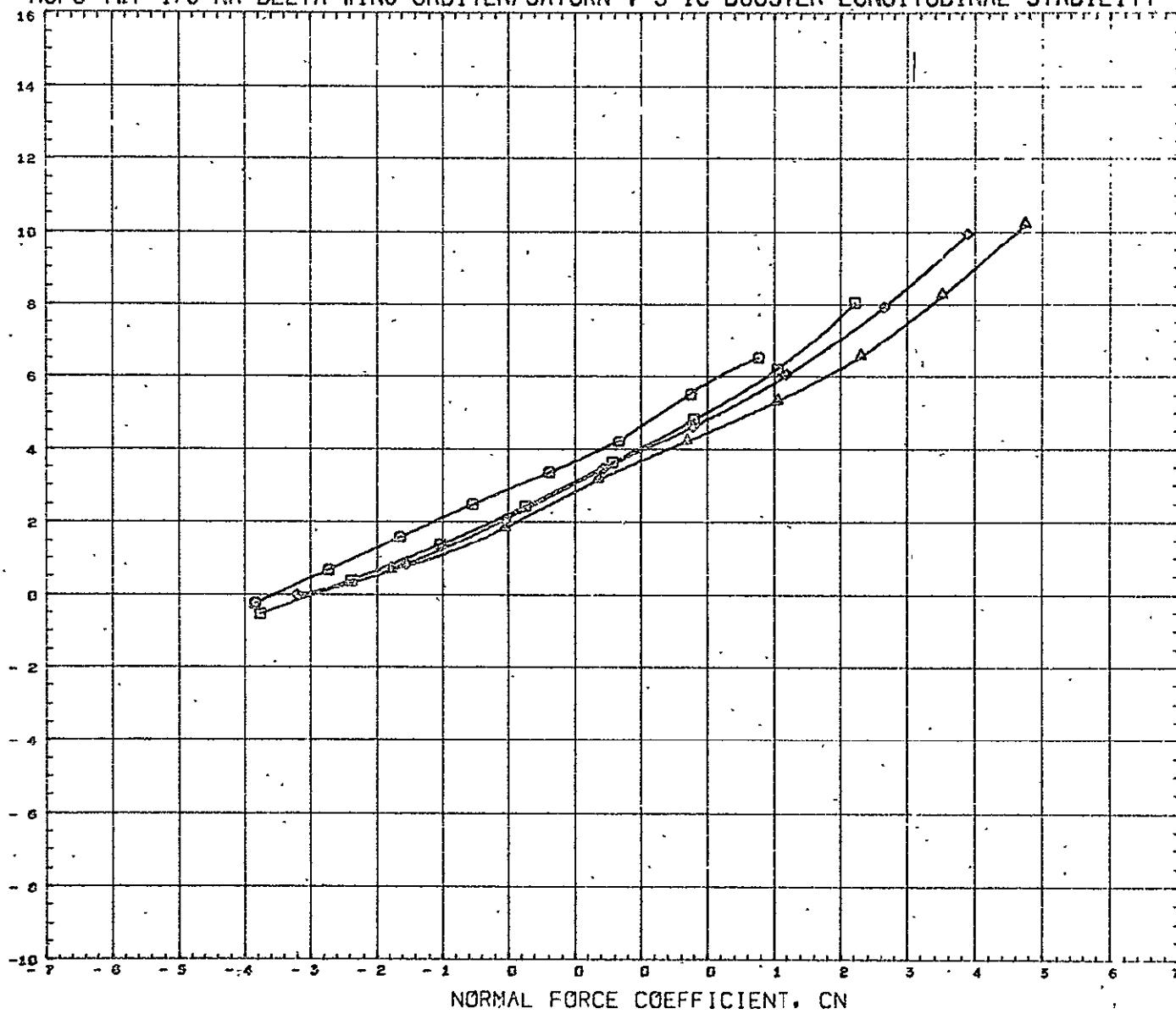
REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YMRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 86

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



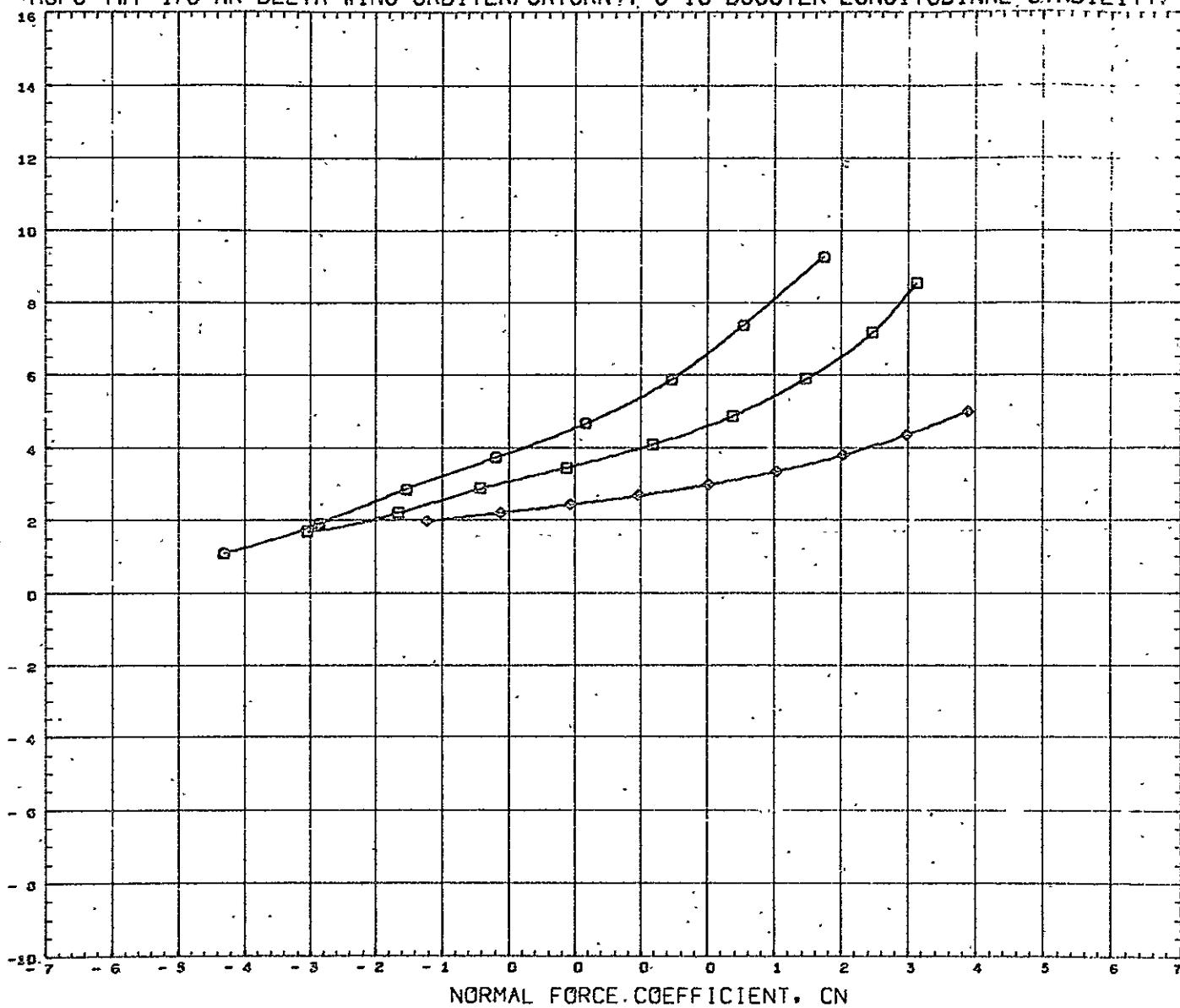
SYMBOL MACH PARAMETRIC VALUES
 ◻ 0.599 BETA - 0.020 ORBINC 4.000.

DATA MIST. CODE MM

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



SYMBOL MACH PARAMETRIC VALUES
 O 1.200 BETA - 0.020 ORBINC 4.000

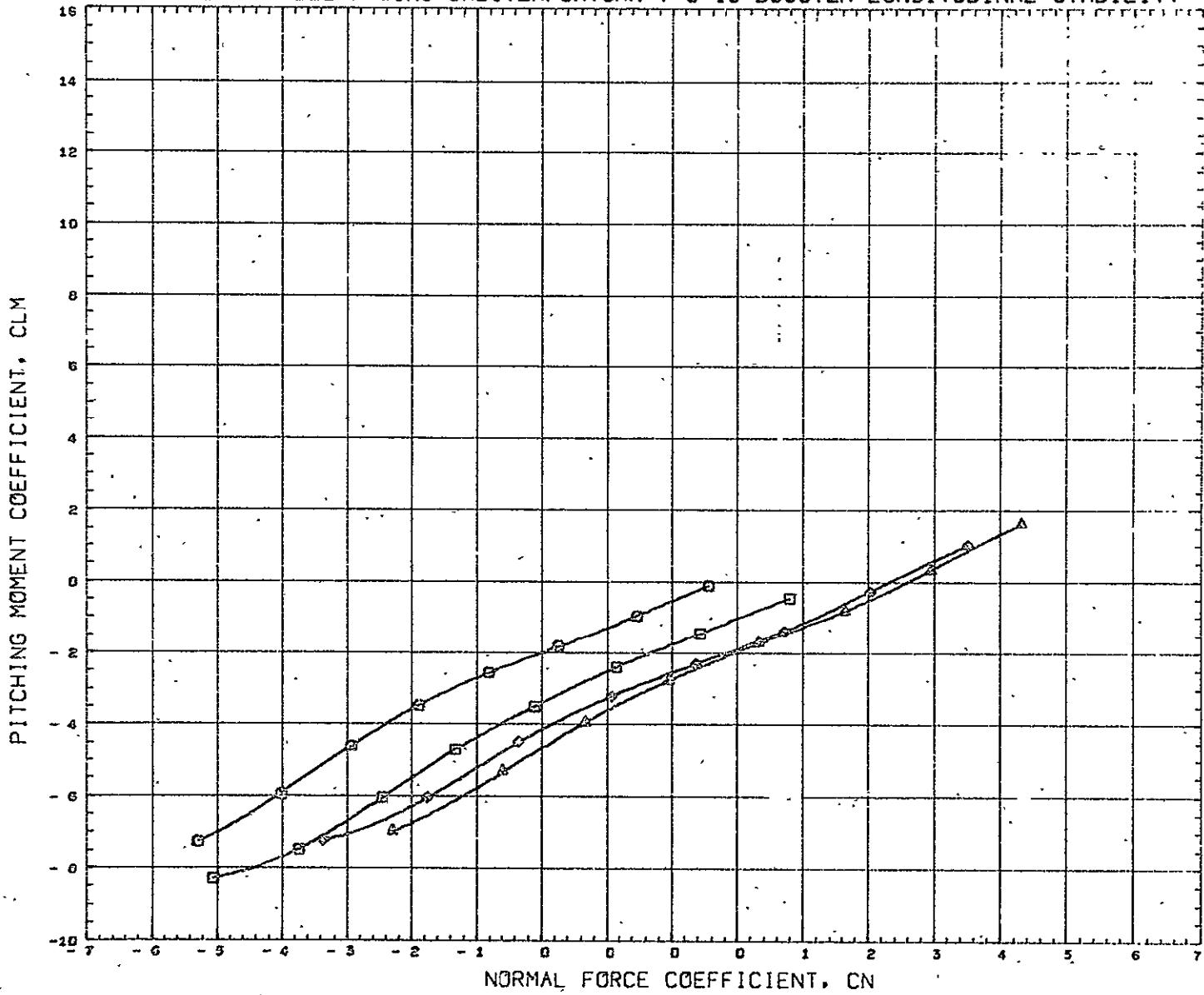
NORMAL FORCE COEFFICIENT, CN

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRP 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE NH

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71. PAGE 88

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

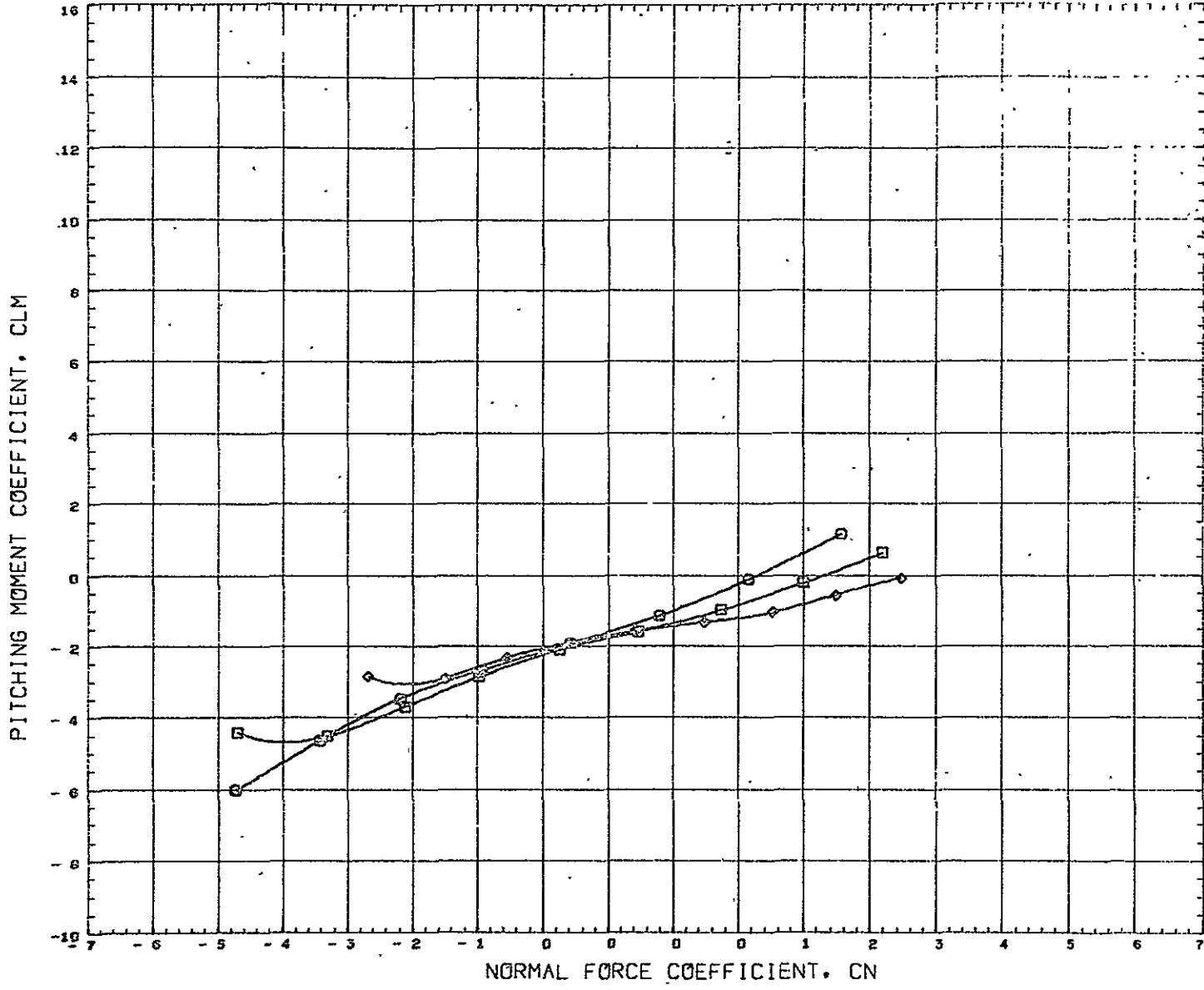


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.599 BETA 0.010 ORBINC - 2.000
 □ 0.697
 ◇ 0.994
 △ 1.091

DATA HIST. CODE NH

REFERENCE INFORMATION
 REFS 1.3960, SQ. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRF 5.2640 INCHES
 YMRF 0.0000' INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



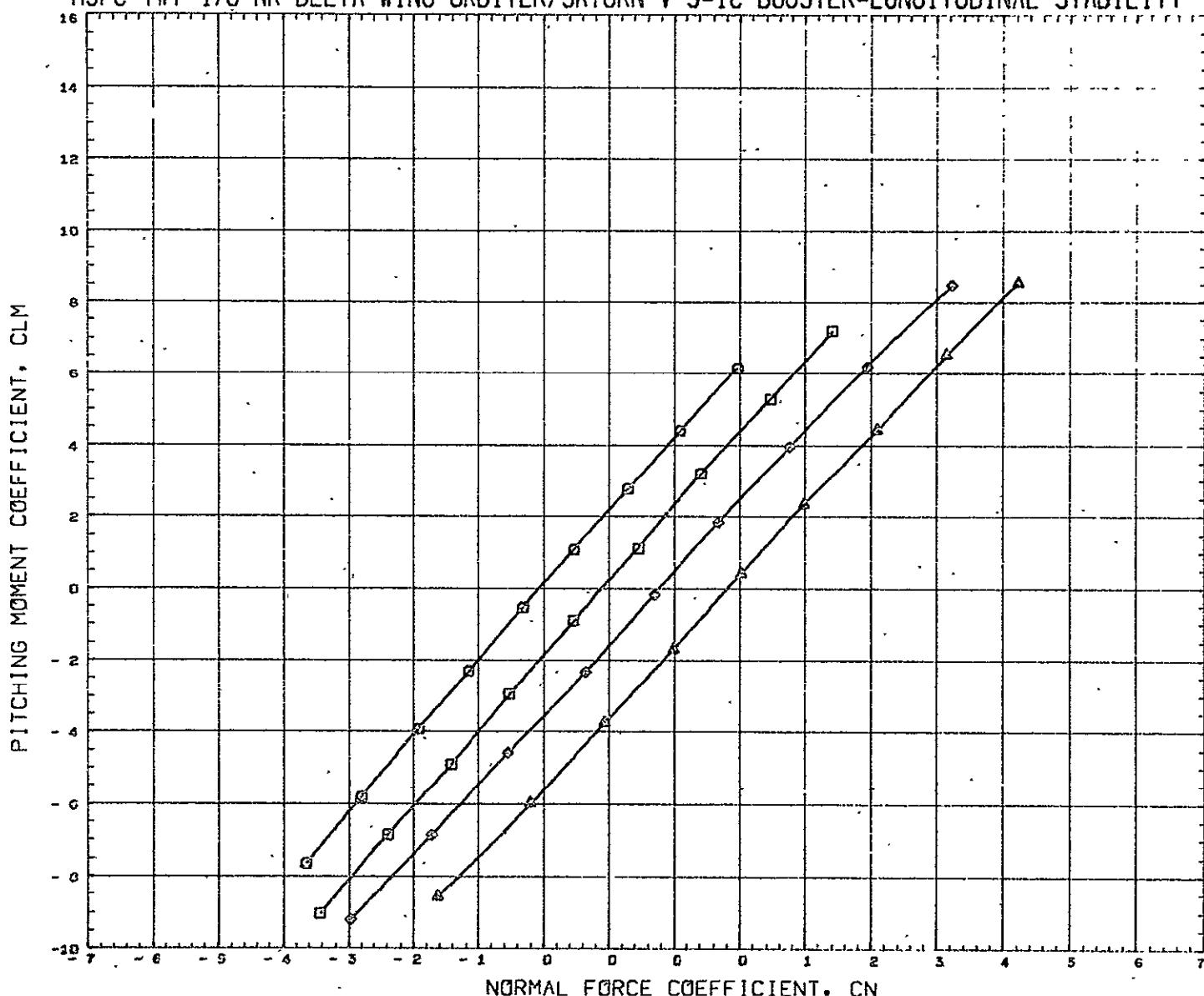
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC = 2.000
□	1.195			
◻	1.452			
◊	1.955			

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 90

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



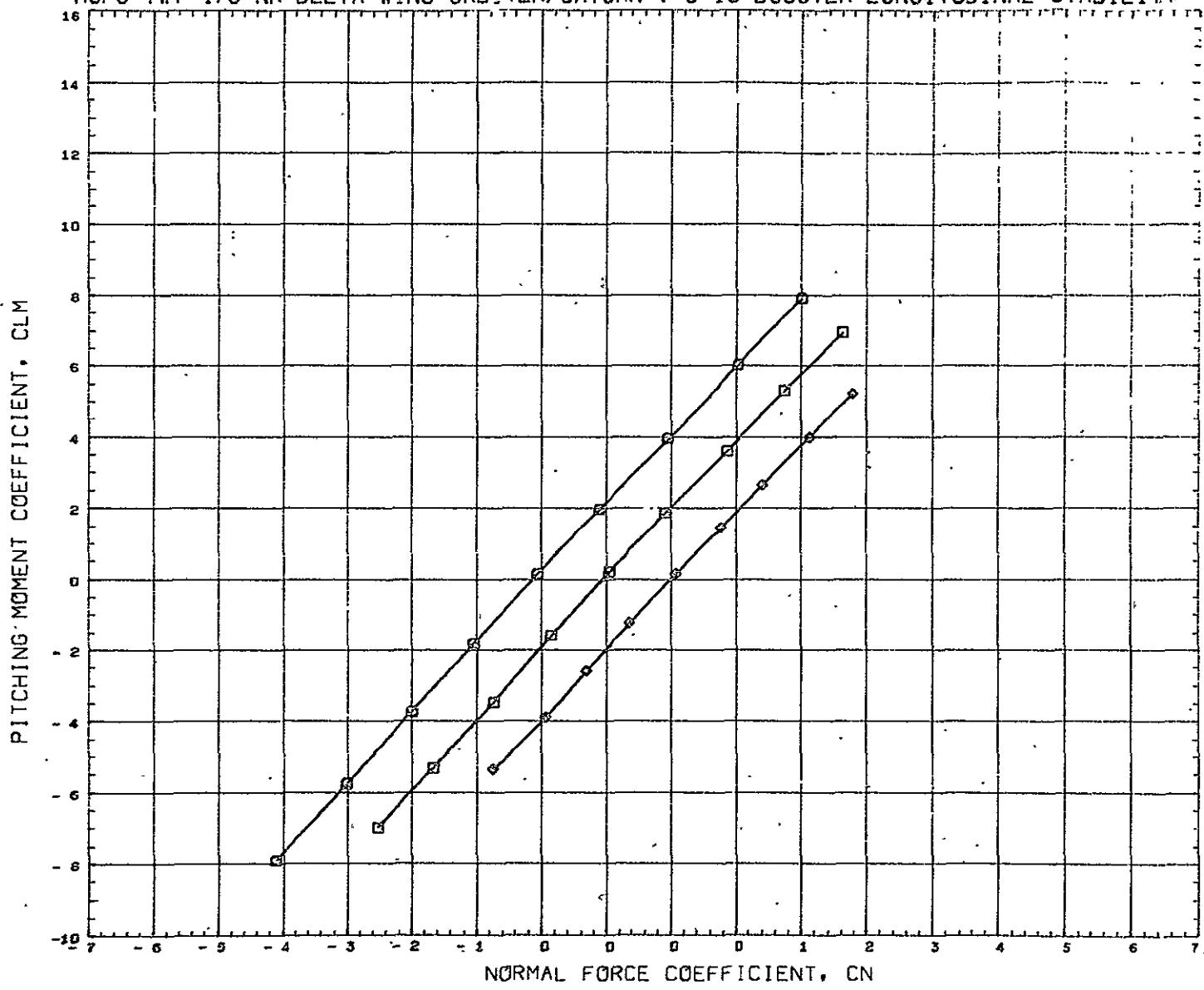
SYMBOL	MACH		PARAMETRIC VALUES
□	0.603	BETA	0.010 ORBINC
□	0.901		
◊	0.995		
△	1.103		-

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
ZHRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MN

MSFC 476 NR HCR0RB/S-ICB00STER 8S+B5W14E3V17 (R25061) 08 JAN 71 PAGE 91

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



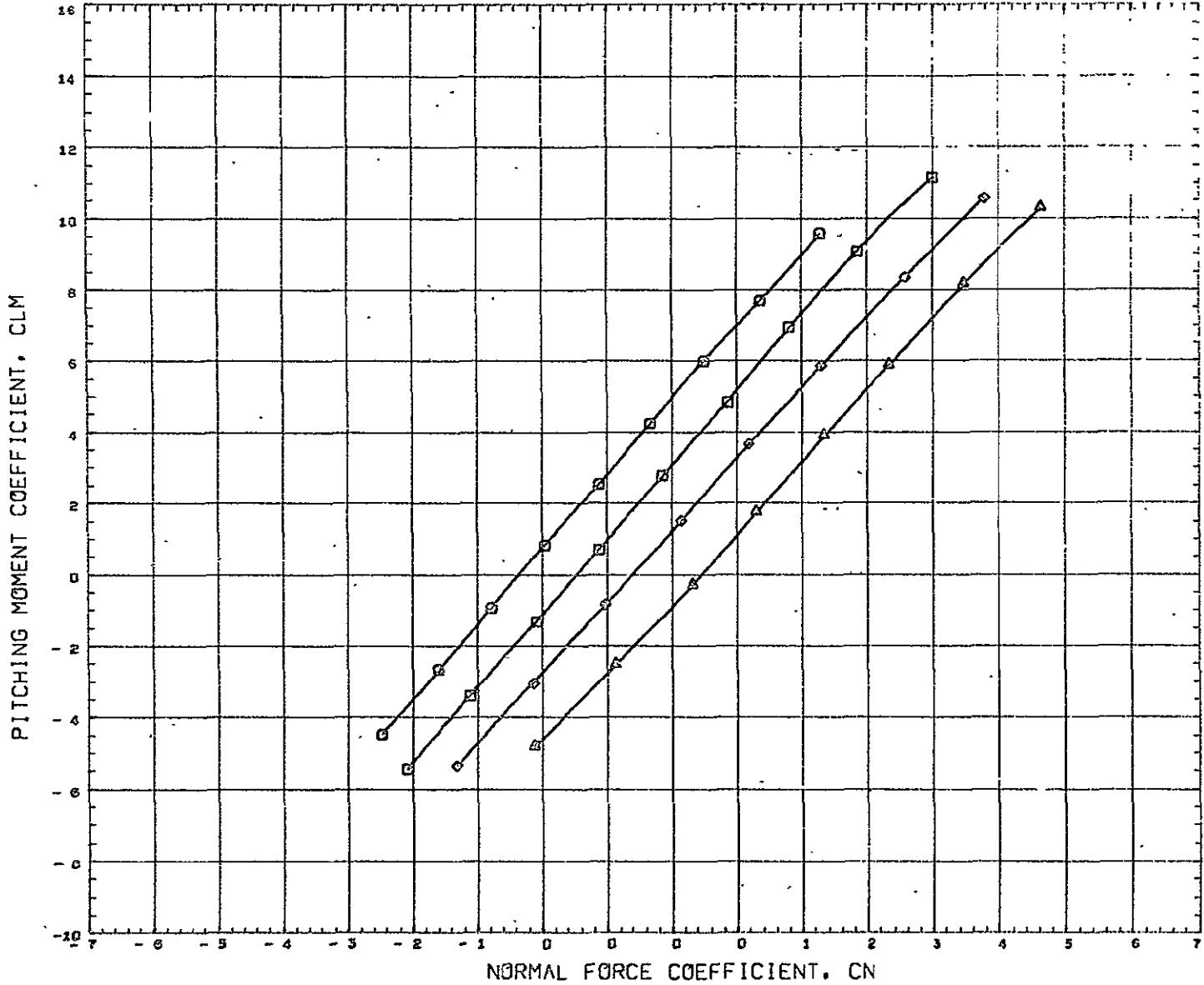
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	0.010	ORBINC
○	1.196			1.000
□	1.467			
◊	1.985			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
MHRF	5.2640	INCHES
THRF	0.0000	INCHES
MZRF	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MM

MSFC 476 NR HCRGRB/S-ICBOOSTER BS+BSW14E3V17 (R25061) 08 JAN 71 PAGE 92

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.600		- 0.020 ORBINC
□	0.689		
◊	0.992		
△	1.093		

1/65

REFERENCE INFORMATION		
EFS	1.3960	SQ.IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRP	5.2640	INCHES
MRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE 4G

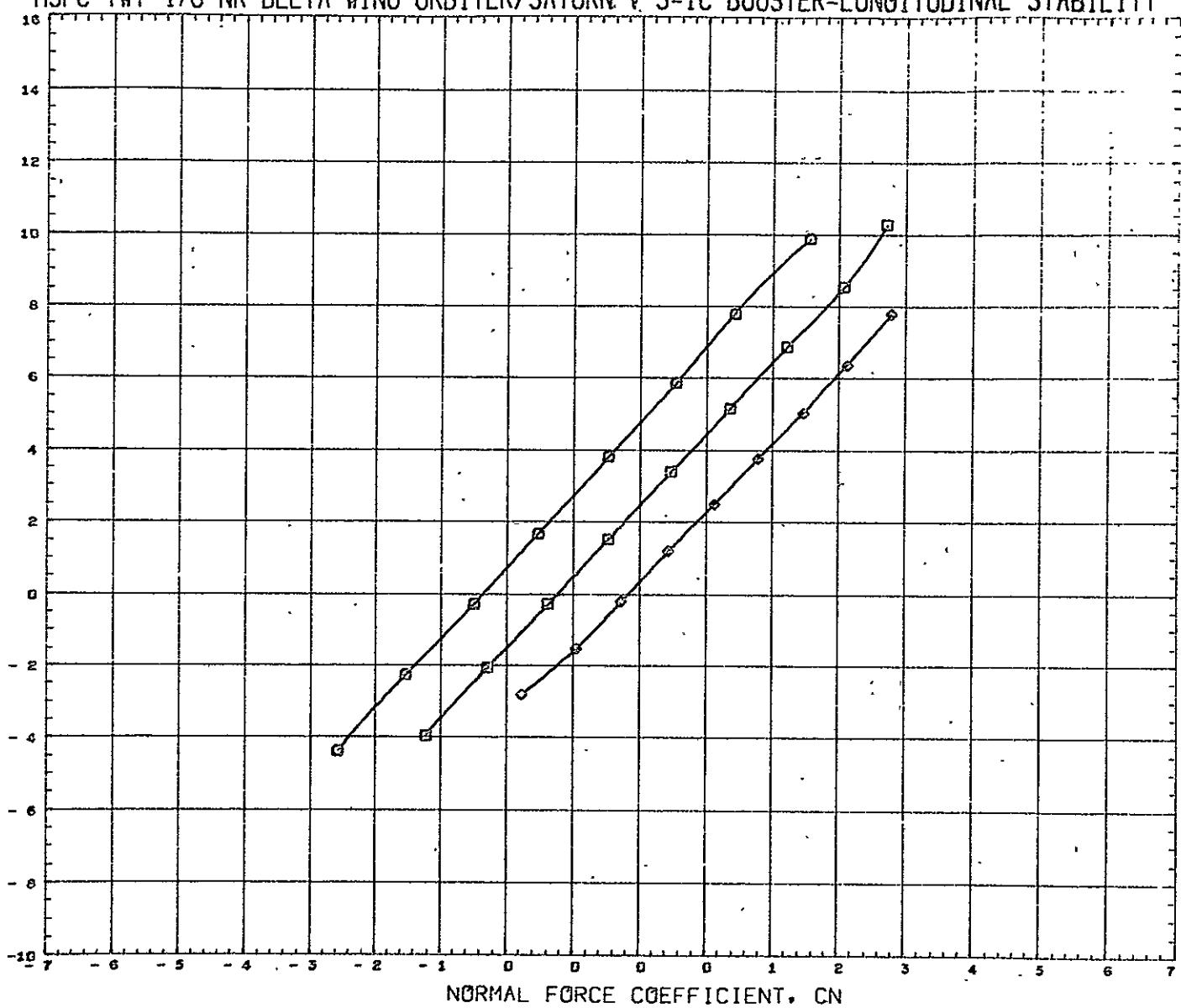
MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17

(225071) 14 JAN 71

PAGE

93

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



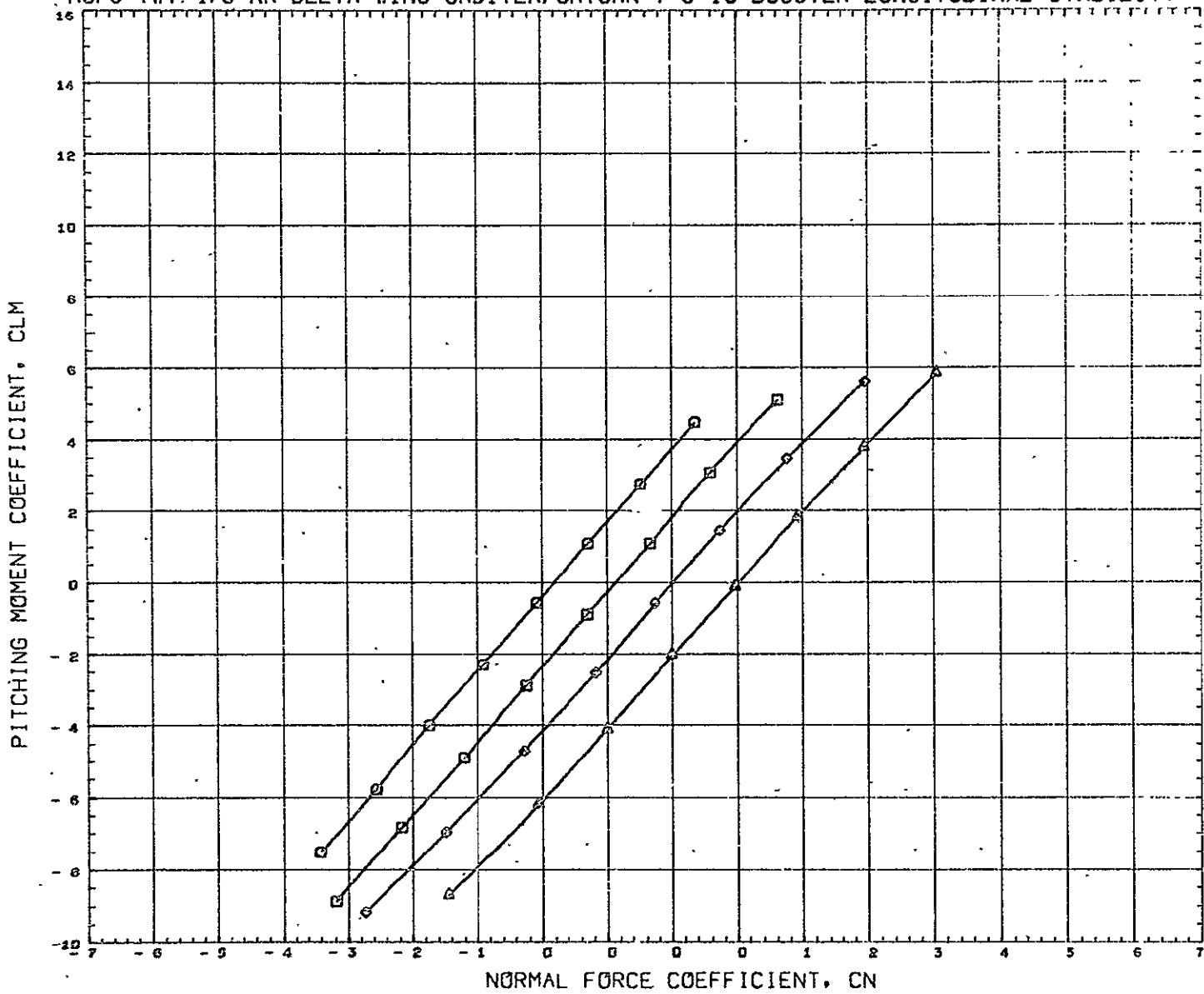
SYMBOL	MACH	PARAMETRIC VALUES		
		BETA	-	ORBINC
□	1.199		- 0.020	4.1
□	1.455			
◊	1.967			

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE *G

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (Z25071) 14 JAN 71 PAGE 94

MSFC TWT. 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

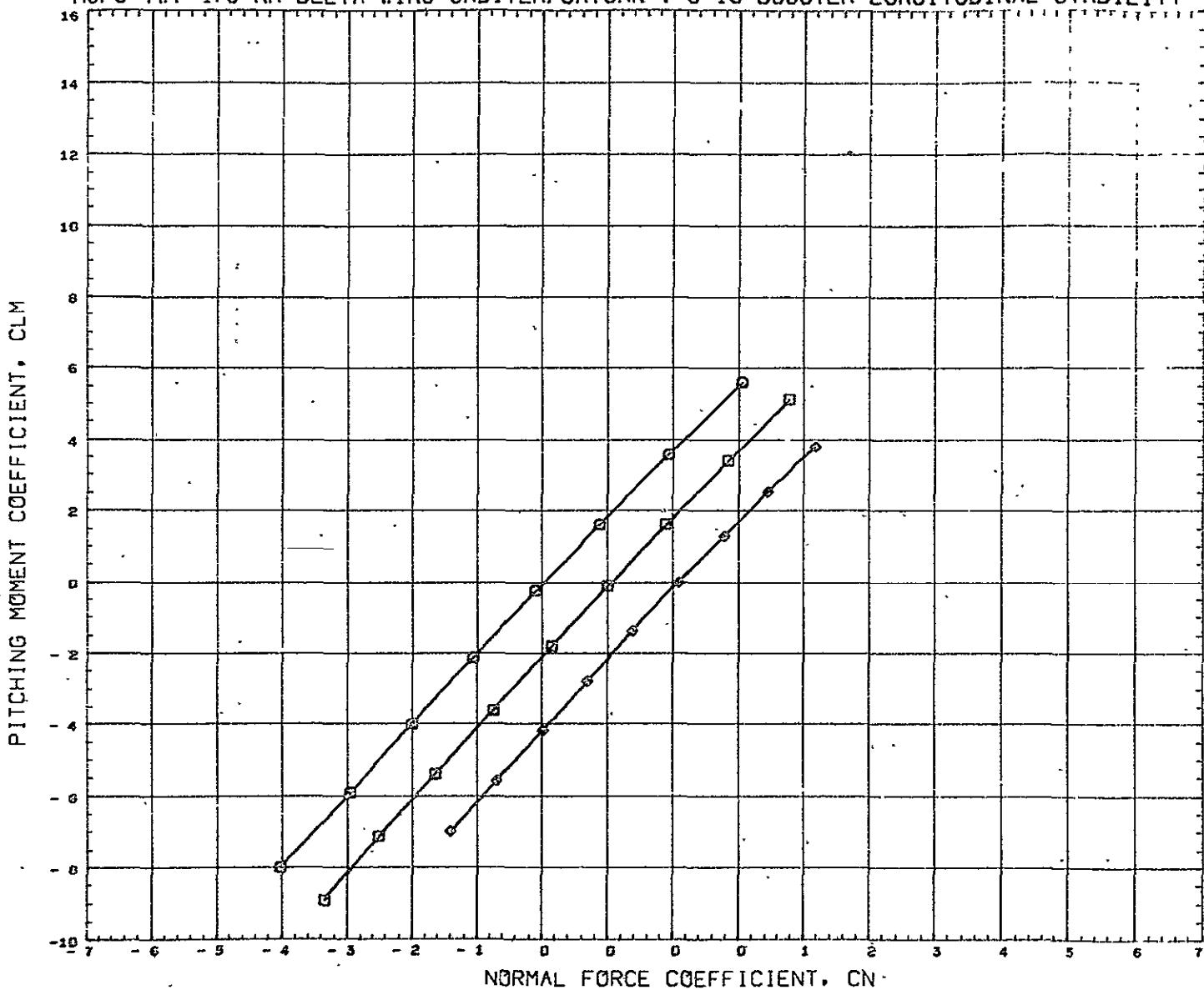


		PARAMETRIC VALUES		
SYMBOL	MACH	BETA	O.000	ORBINC
○	0.600		0.000	- 2.000
□	0.696			
◊	1.002			
△	1.101			

DATA HIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN-V S-IC BOOSTER-LONGITUDINAL STABILITY



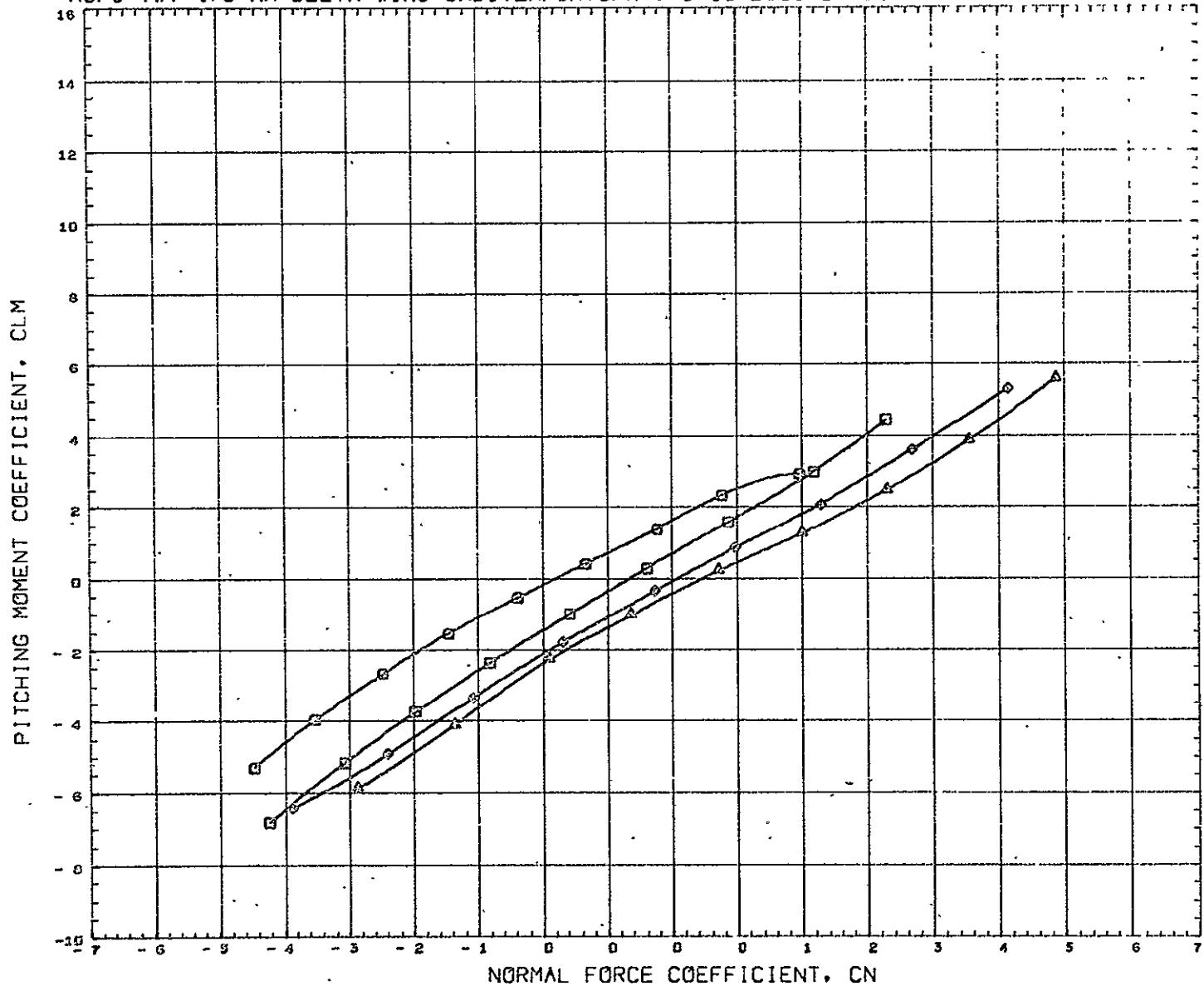
		PARAMETRIC VALUES		
SYMBOL	MACH	BETA	0.000	ORBINC - 2.000
○	1.198			
□	1.459			
◊	1.955			

REFERENCE INFORMATION		
EFS	1.3960	SQ.IN.
EPL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB000STER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 96

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



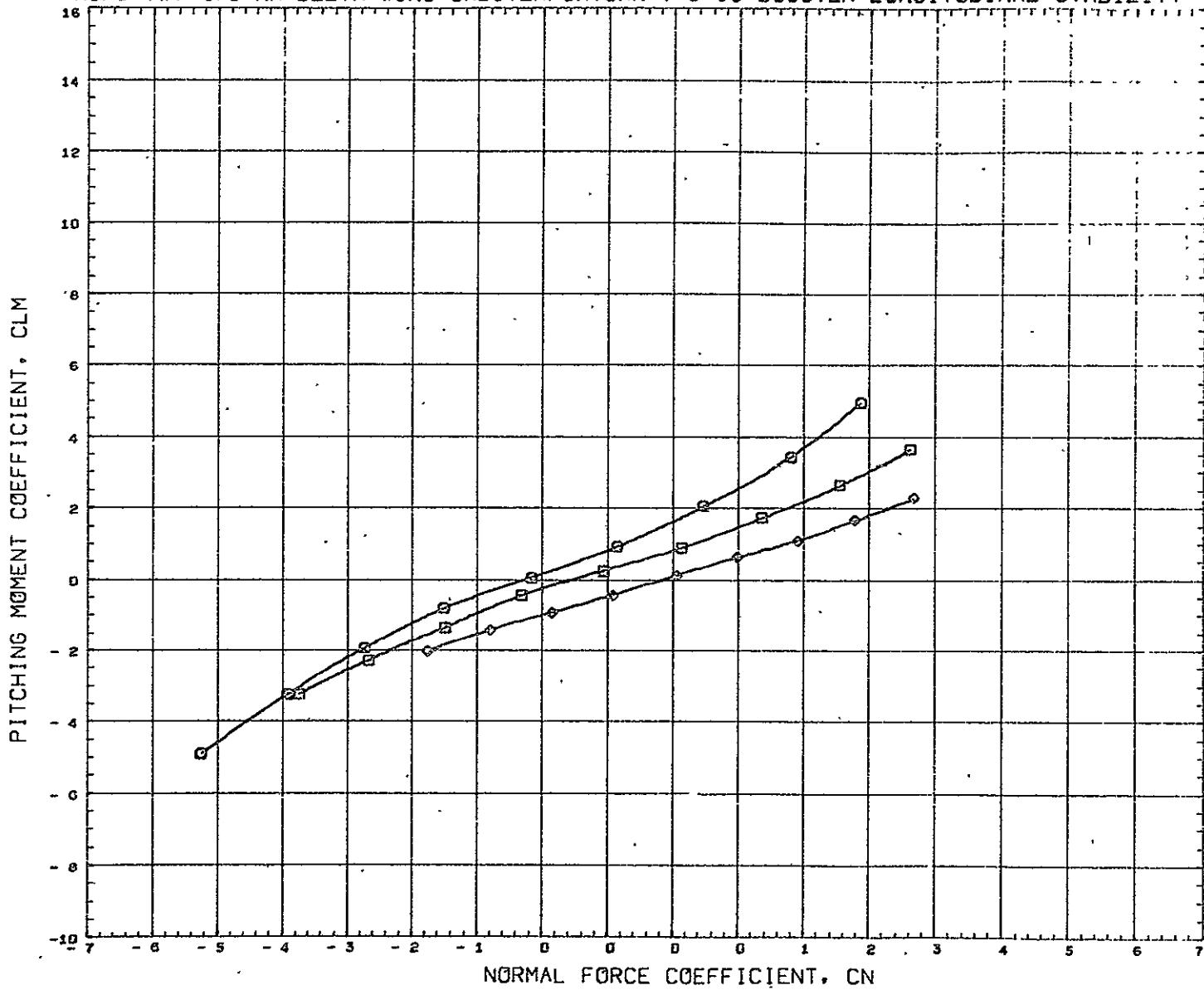
SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.601 0.601 0.000 ORBINC 1.000

REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034 INCHES

DATA MIST. CODE MH

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (CR25091) 08 JAN 71 PAGE 97

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES
○	1.194	BETA	0.000 ORBINC 1
□	1.461		
◊	1.960		

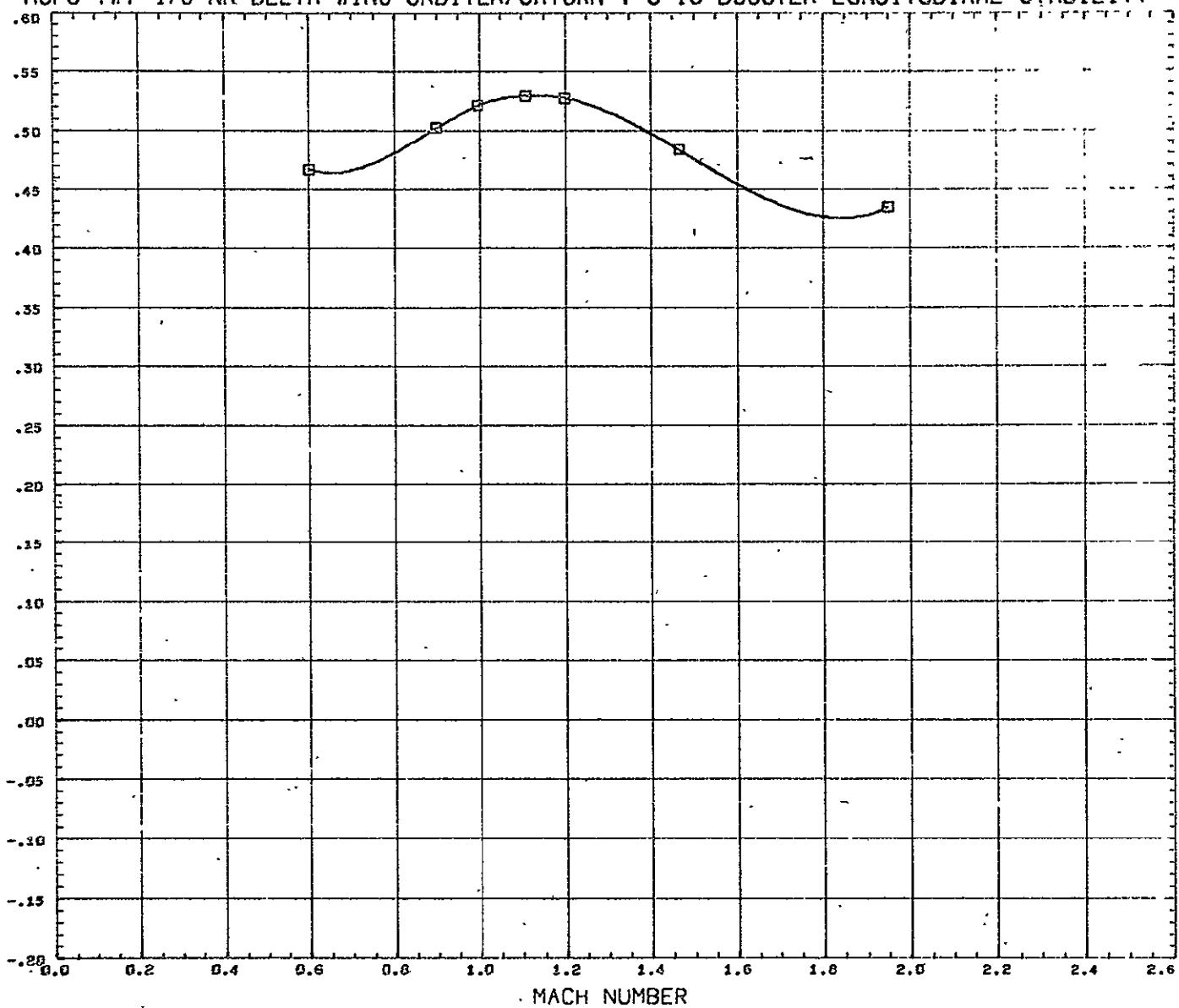
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REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XNRP	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0336	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC 476 NR HCR0RB/S-ICB00STER BF2S+B5W14E3V17 (R250910) 08 JAN 71 PAGE 98

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE, D(CN) PER DEGREE



PARAMETRIC VALUES
BETA 0.020 ORBINC 1.000

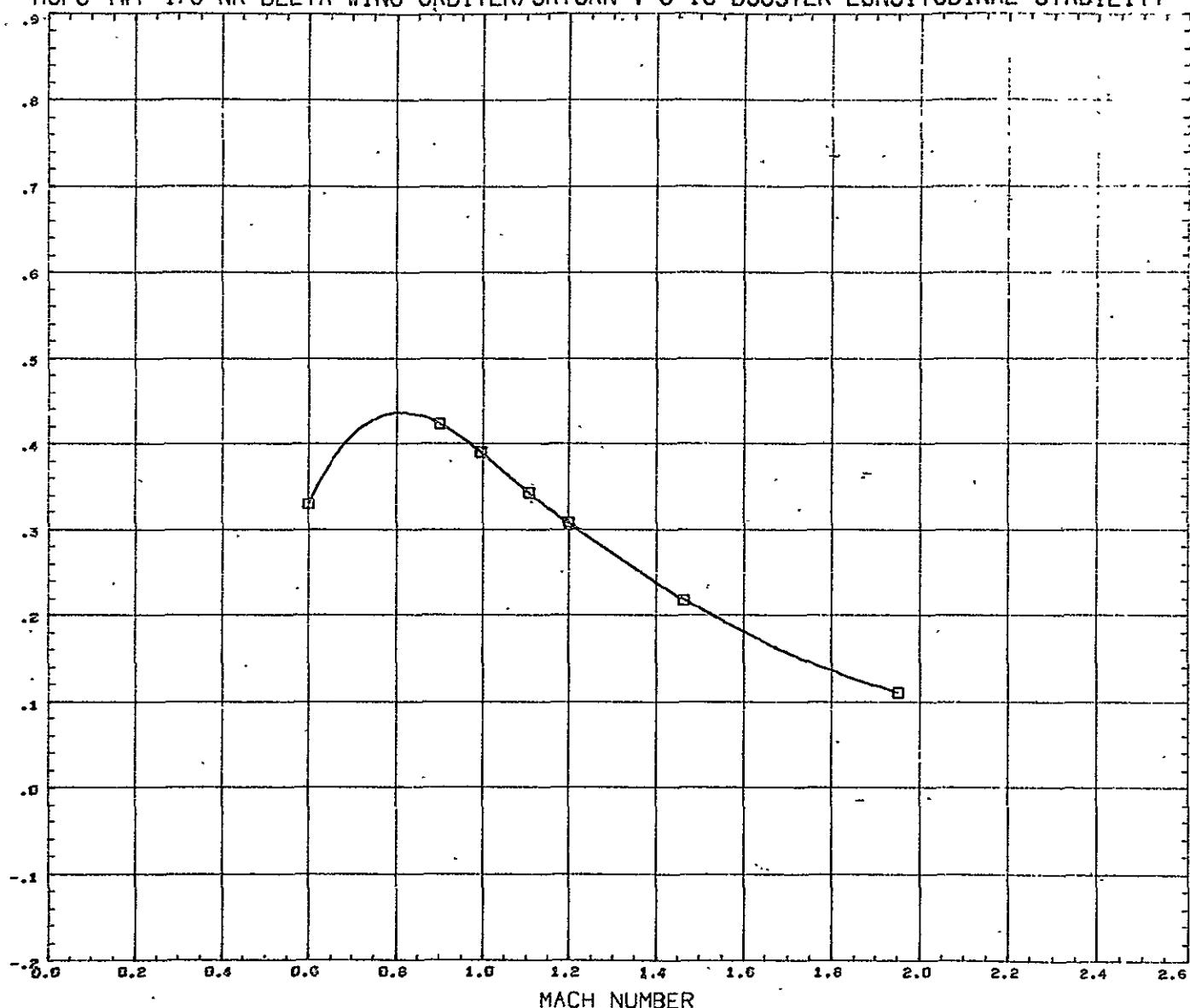
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

DATA MIST. CODE HNV

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (B25021) 14 JAN 71 PAGE 99

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CL/M) PER DEGREE



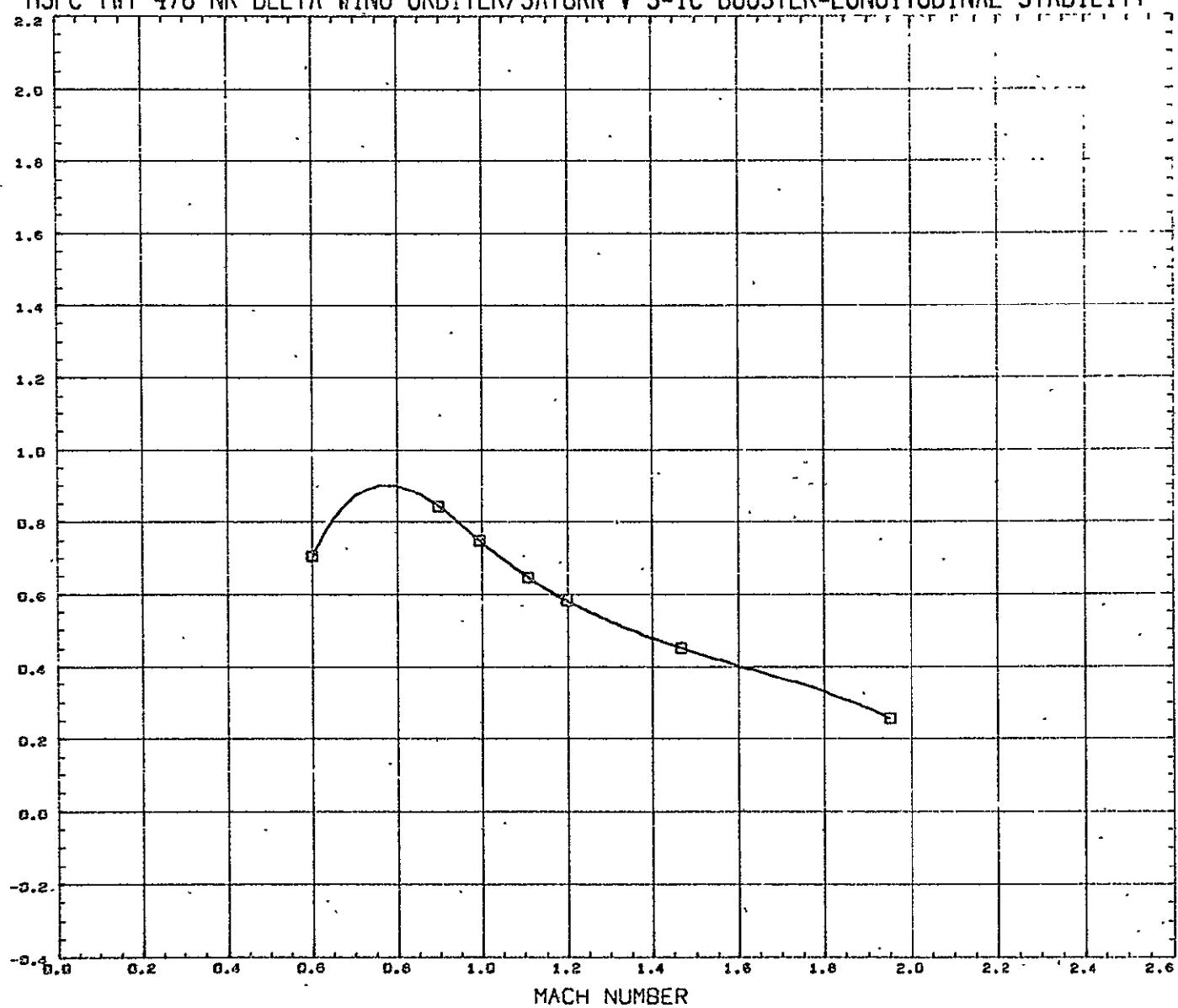
PARAMETRIC VALUES
BETA 0.020 ORBINC 1.000

DATA HIST. CODE MMV

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRC 5.2640 INCHES
YHRC 0.0000 INCHES
ZHRC 0.0330 INCHES
SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $DCLM/CN$ PER DEGREE



PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

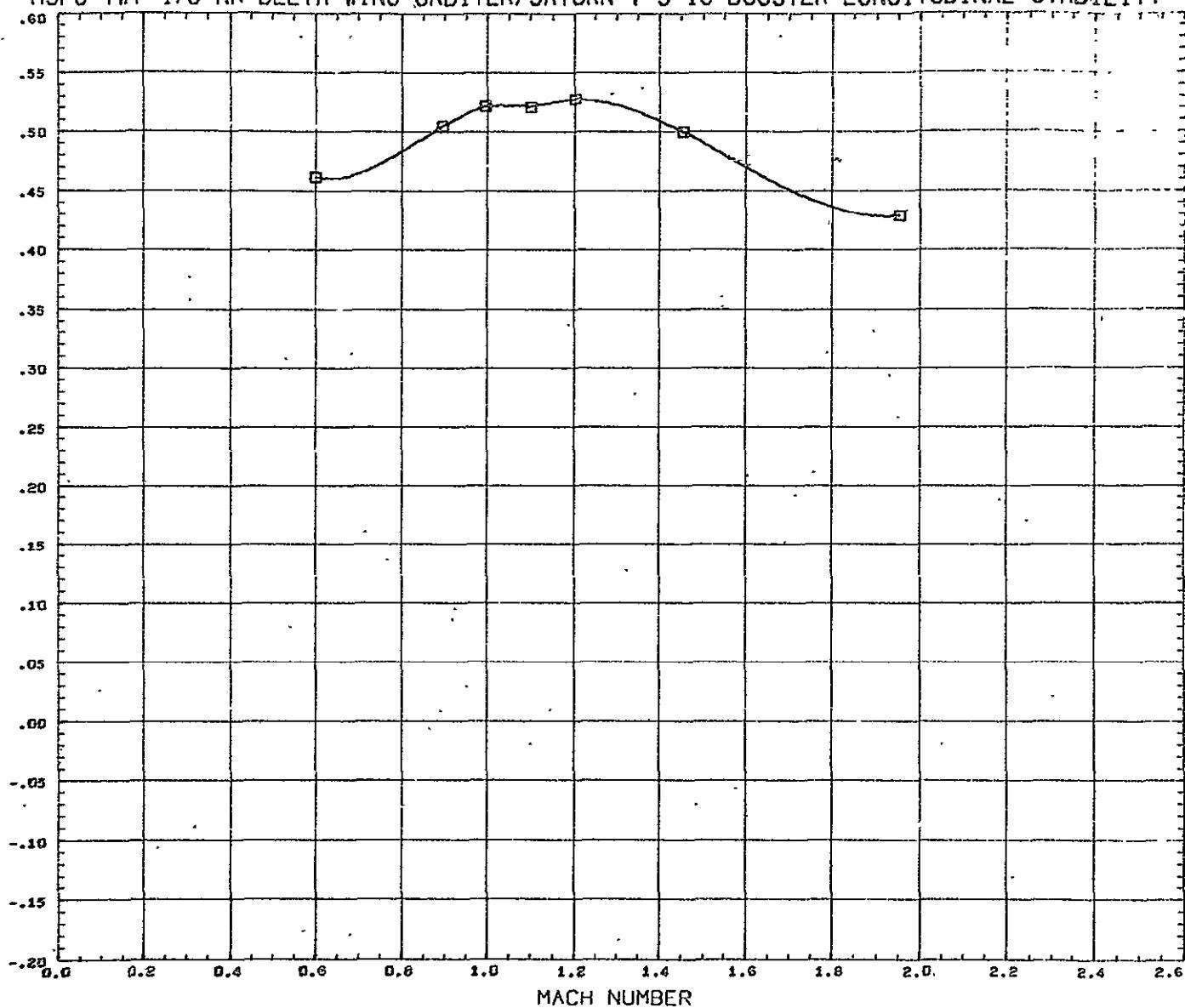
REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	INCHES

DATA MIST. CODE MMV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE, D(CN) PER DEGREE



PARAMETRIC VALUES

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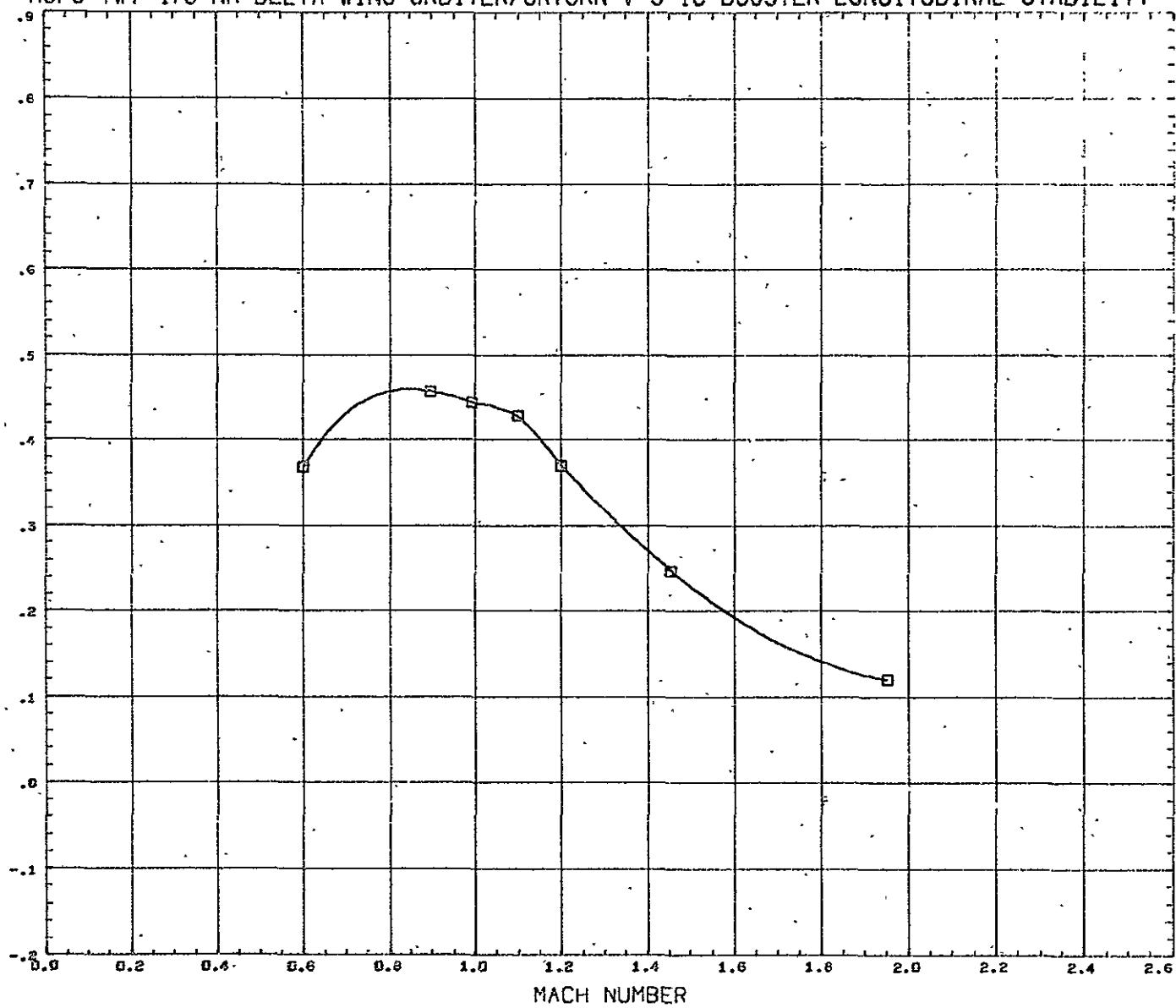
DATA HIST. CODE MHV

REFERENCE INFORMATION

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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CCLM) PER DEGREE



PARAMETRIC VALUES
BETA = 0.020 ORBINC 4.000

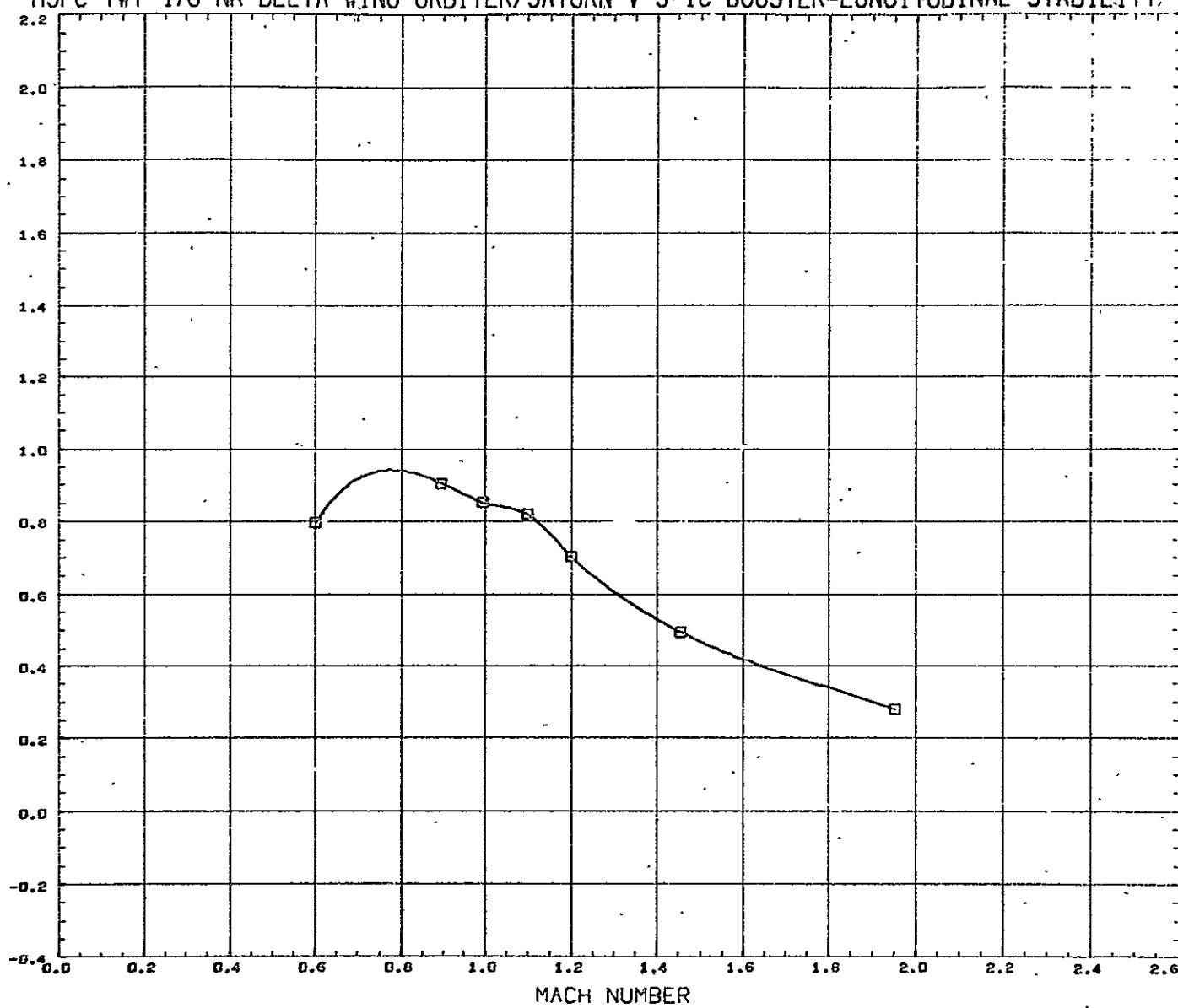
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 REFB 1.3330 INCHES
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 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE NYV

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (B25031) 14 JAN 71 PAGE 103

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY.

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(ClM/CN)$ PER DEGREE



PARAMETRIC VALUES
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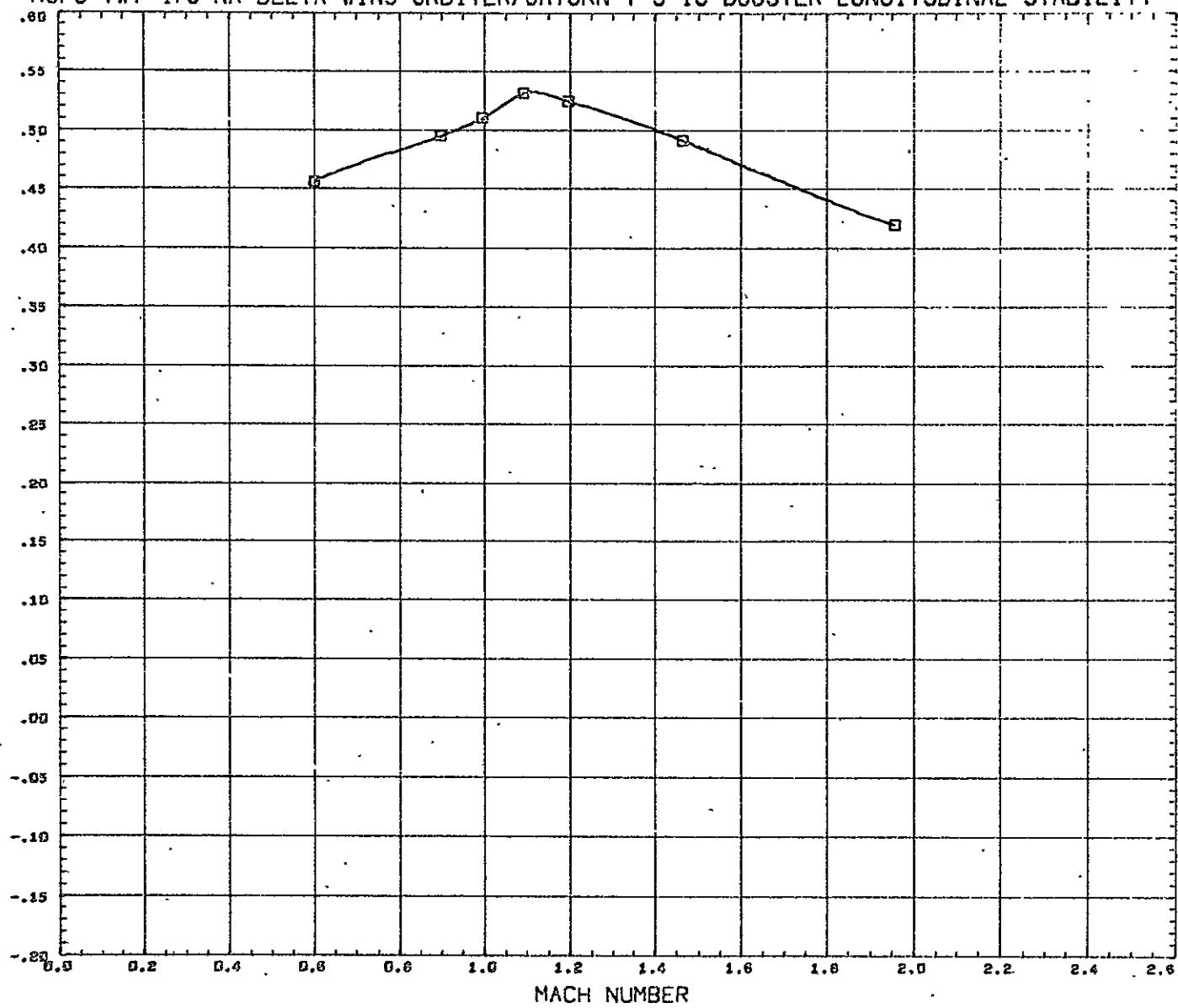
REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZMRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE MHV

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (B25031) 14 JAN 71 PAGE 104

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE. D(CN) PER DEGREE



PARAMETRIC VALUES
BETA 0.010 ORBINC - 2.000

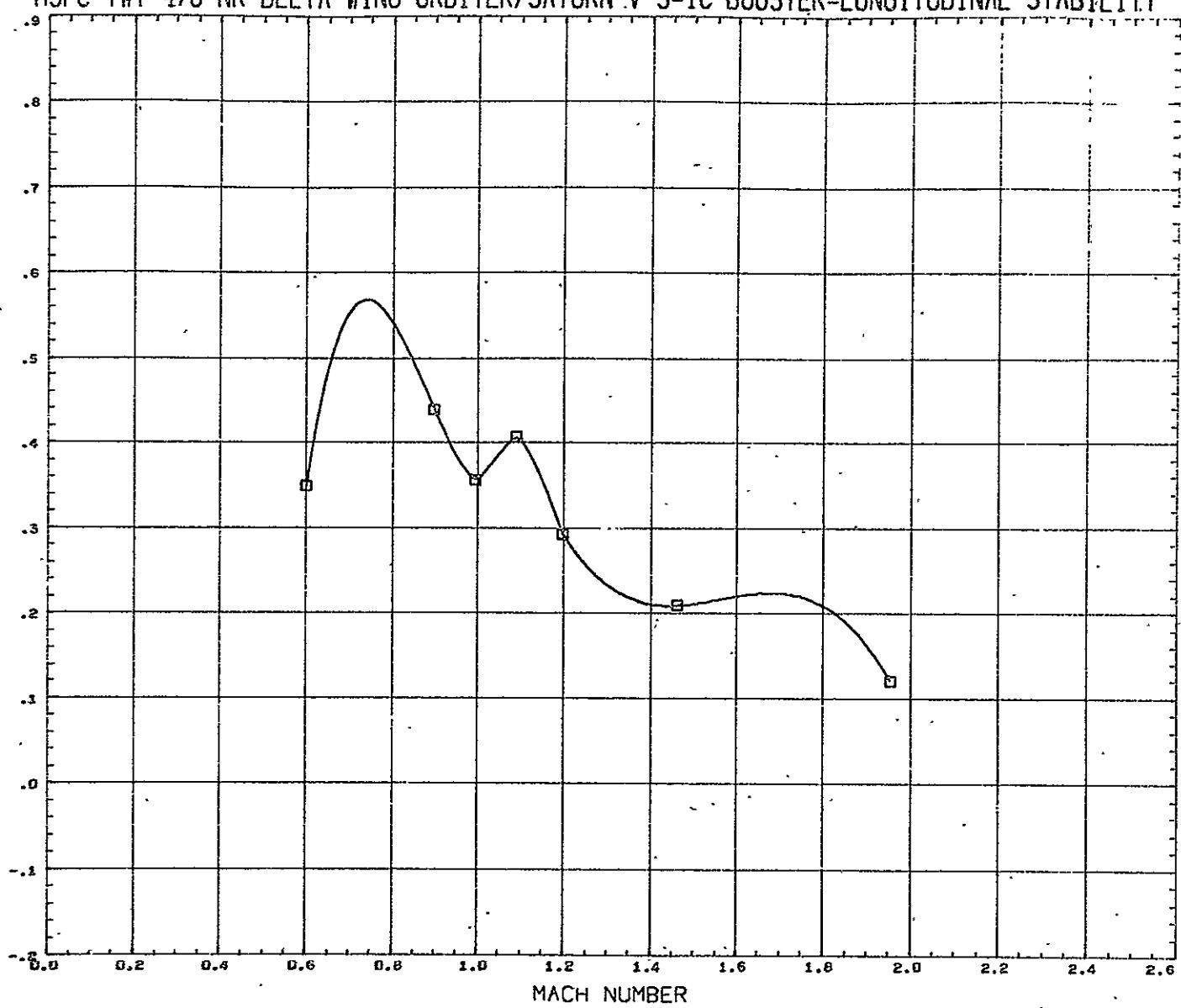
DATA HIST. CODE HHV

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRC	5.2640	INCHES
YNRP	0.0000	INCHES
ZHRC	0.0330	INCHES
SCALE	0.0034	INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CCLM) PER DEGREE



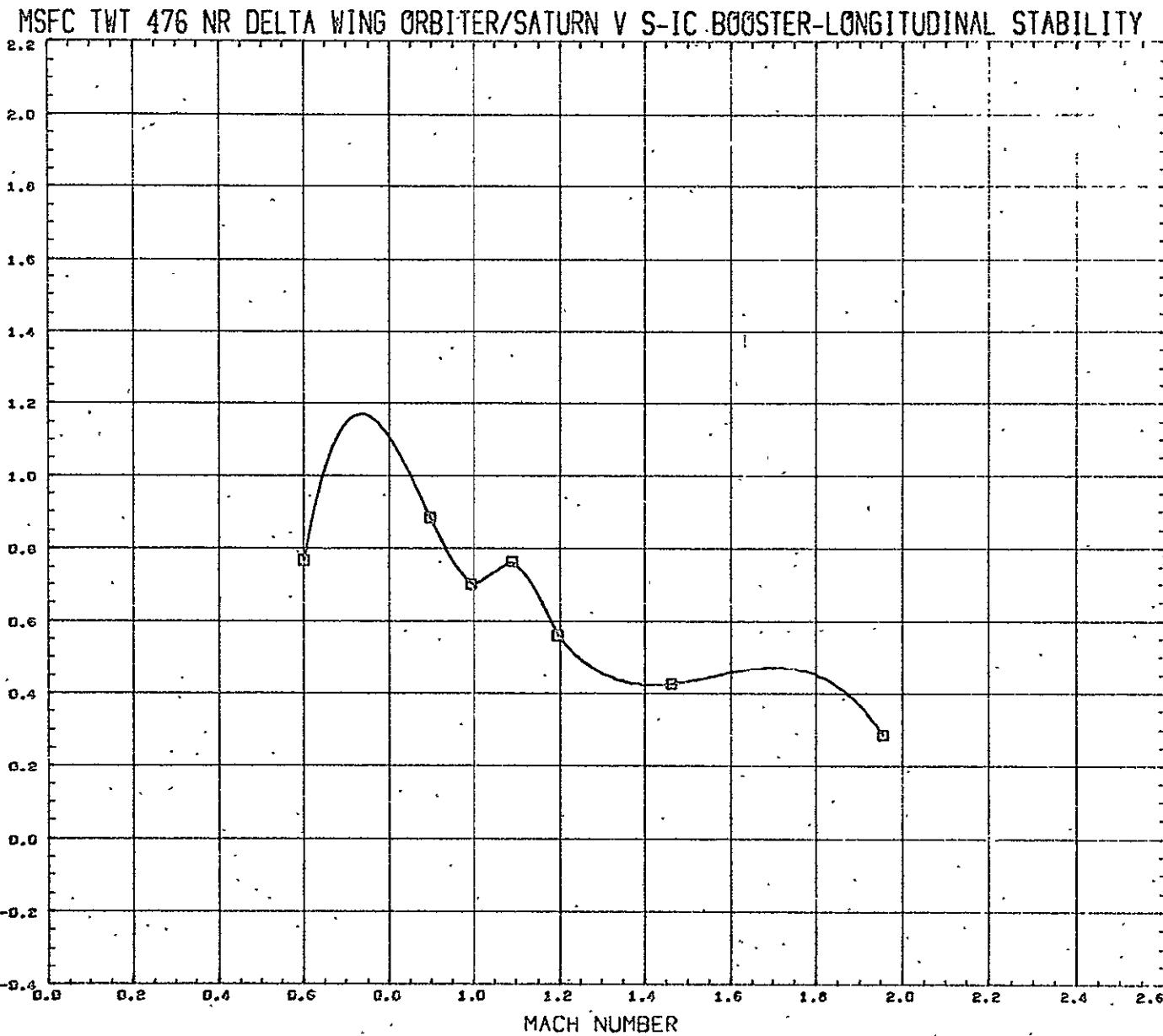
PARAMETRIC VALUES

BETA 0.010 ORBINC - 2.000

DATA HIST. CODE MMV

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	INCHES

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(CL_M/C_N)$ PER DEGREE

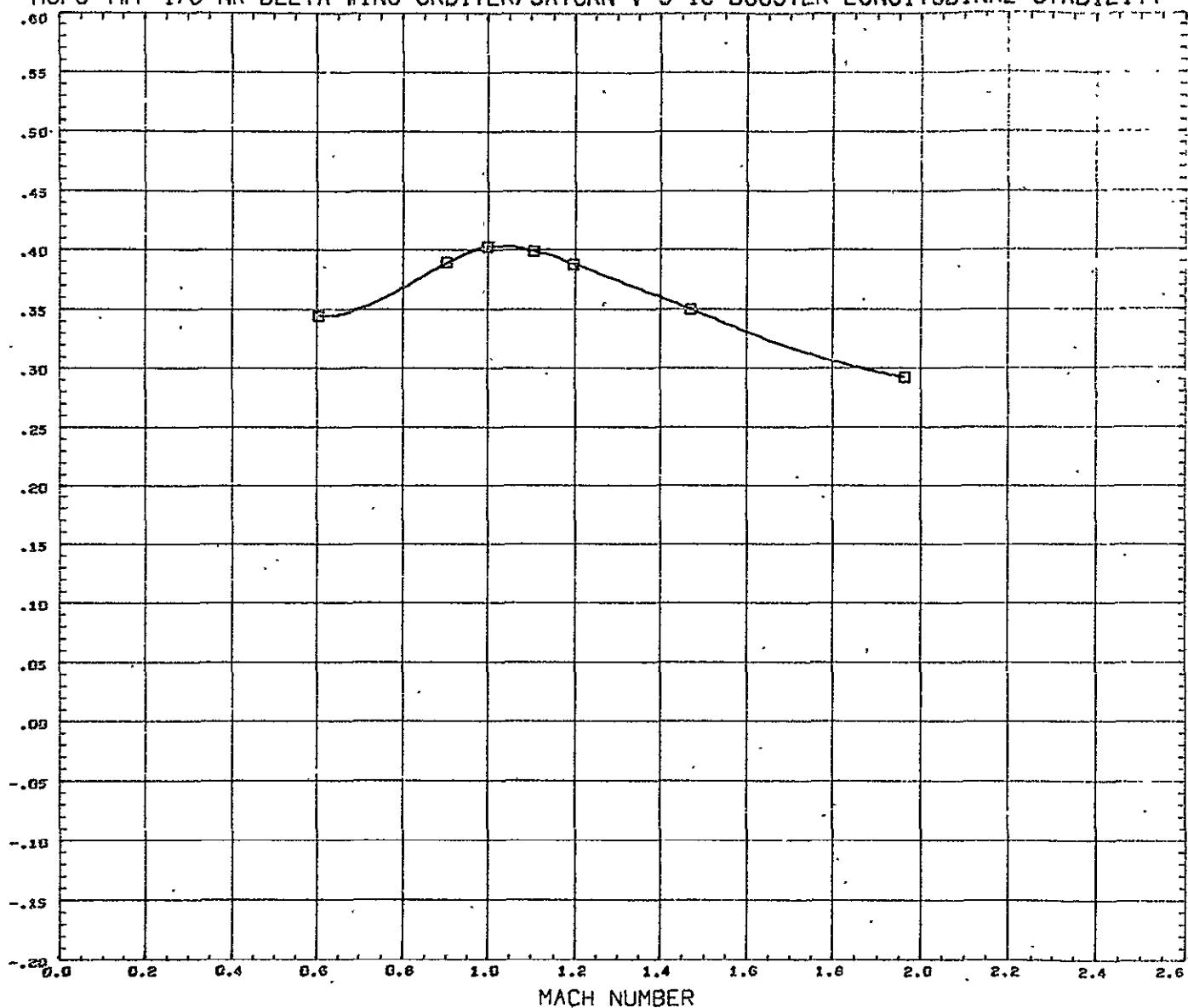
PARAMETRIC VALUES
BETA 0.010 ORBINC - 2.000

DATA MIST. CODE HHV

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE, D(CCN) PER DEGREE



PARAMETRIC VALUES
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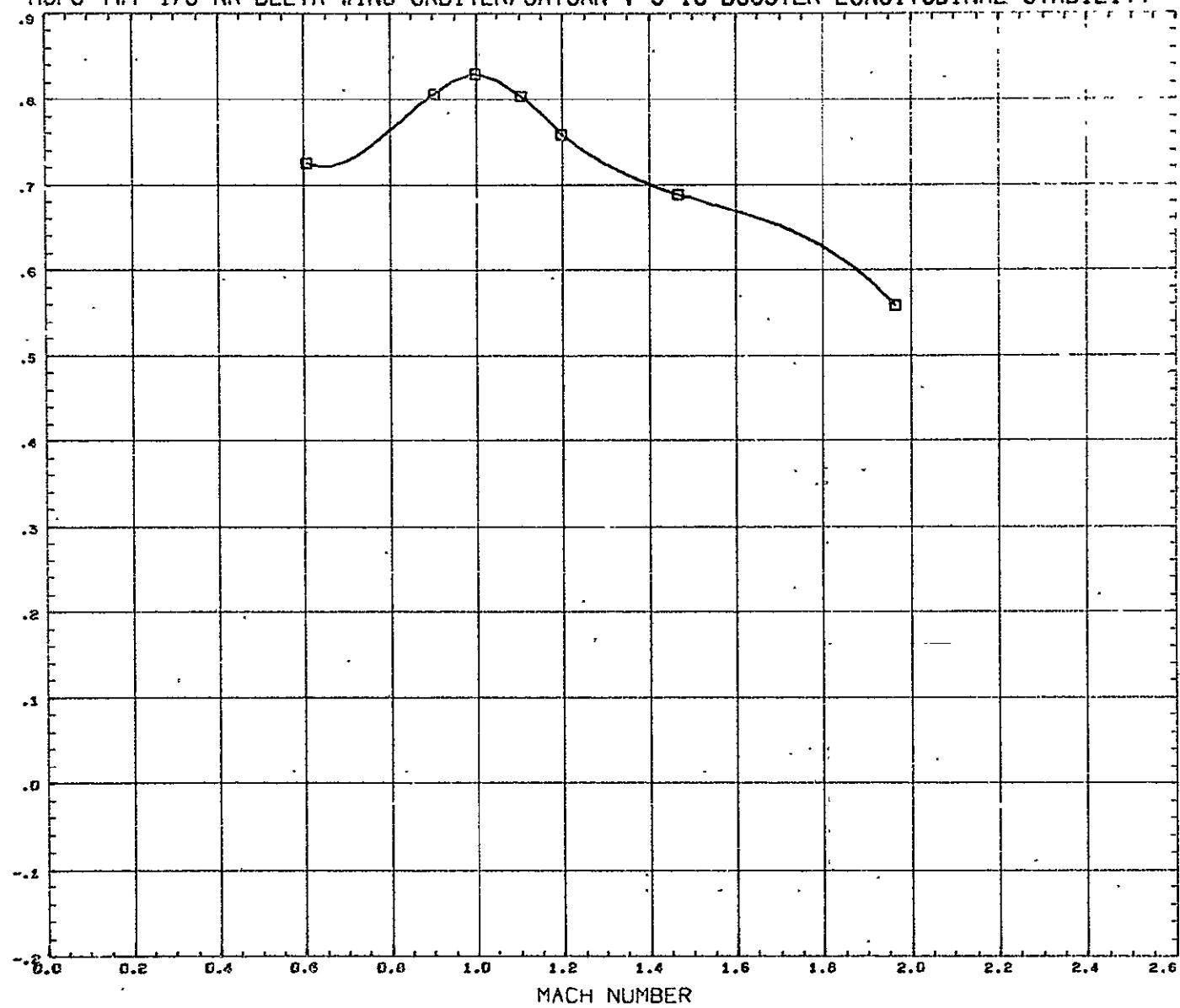
REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

DATA HIST. CODE MHV

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (B25061) 14 JAN 71 PAGE 108

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CCLM) . PER DEGREE



PARAMETRIC VALUES

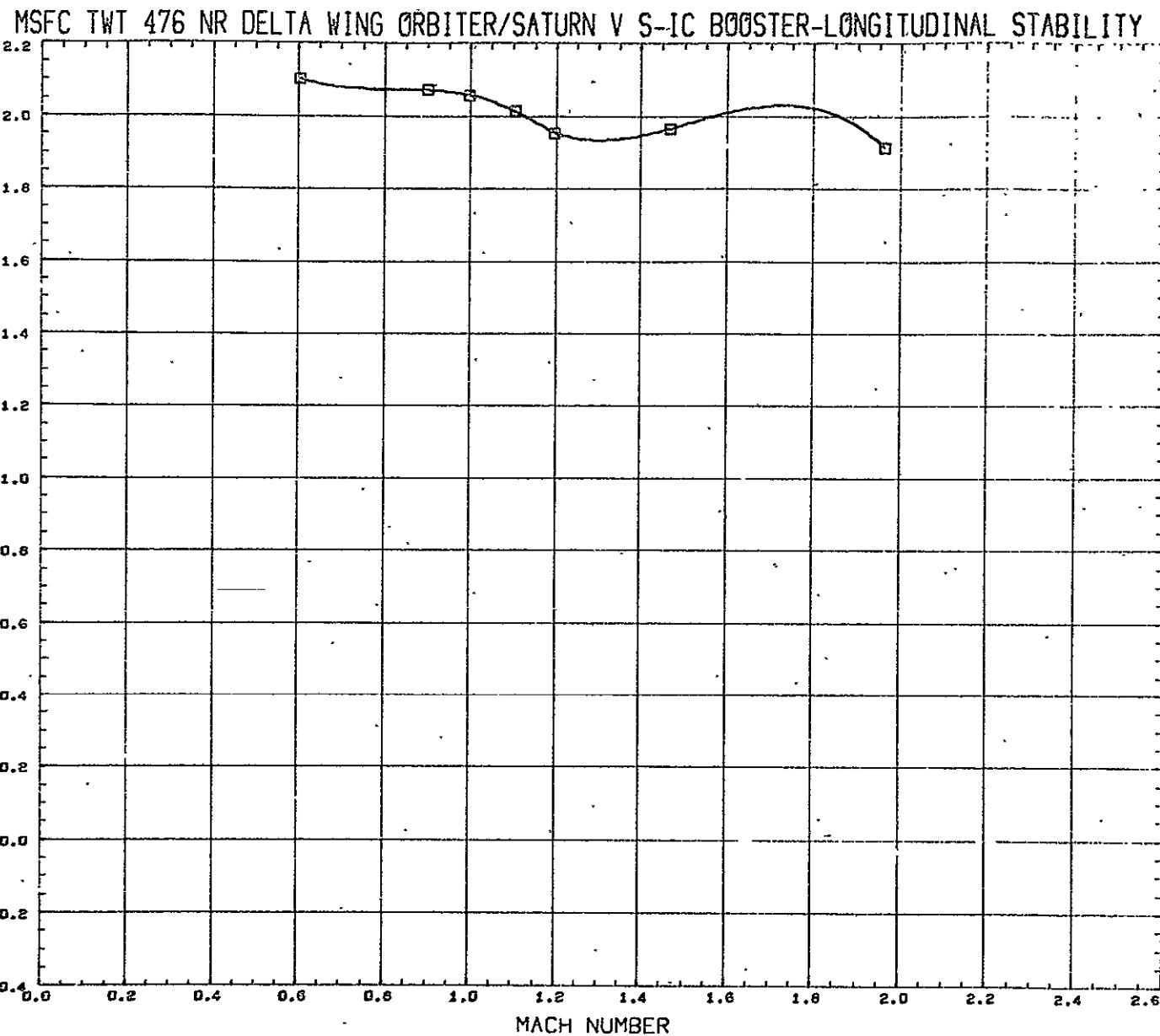
BETA 0.010 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NHV

STATIC LONGITUDINAL STABILITY DERIVATIVE, D(CL/M/CN) PER DEGREE



PARAMETRIC VALUES

BETA 0.010 ORBINC 1.000

REFERENCE INFORMATION

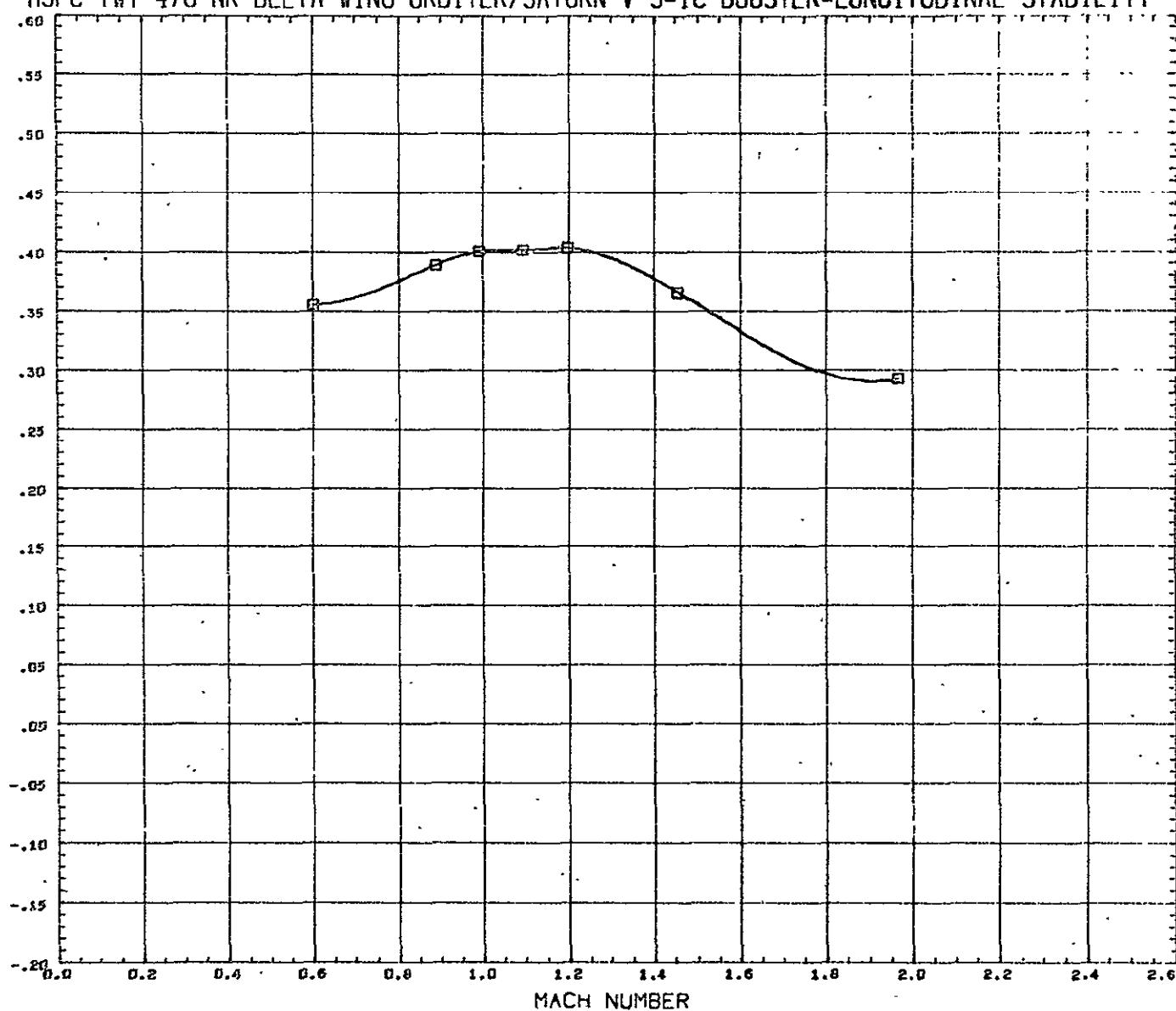
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MNV

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+85W14E3V17 (B25061) 14 JAN 71 PAGE 110

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE, $D(CN)$ PER DEGREE



PARAMETRIC VALUES
BETA = 0.020 ORBINC 4.000

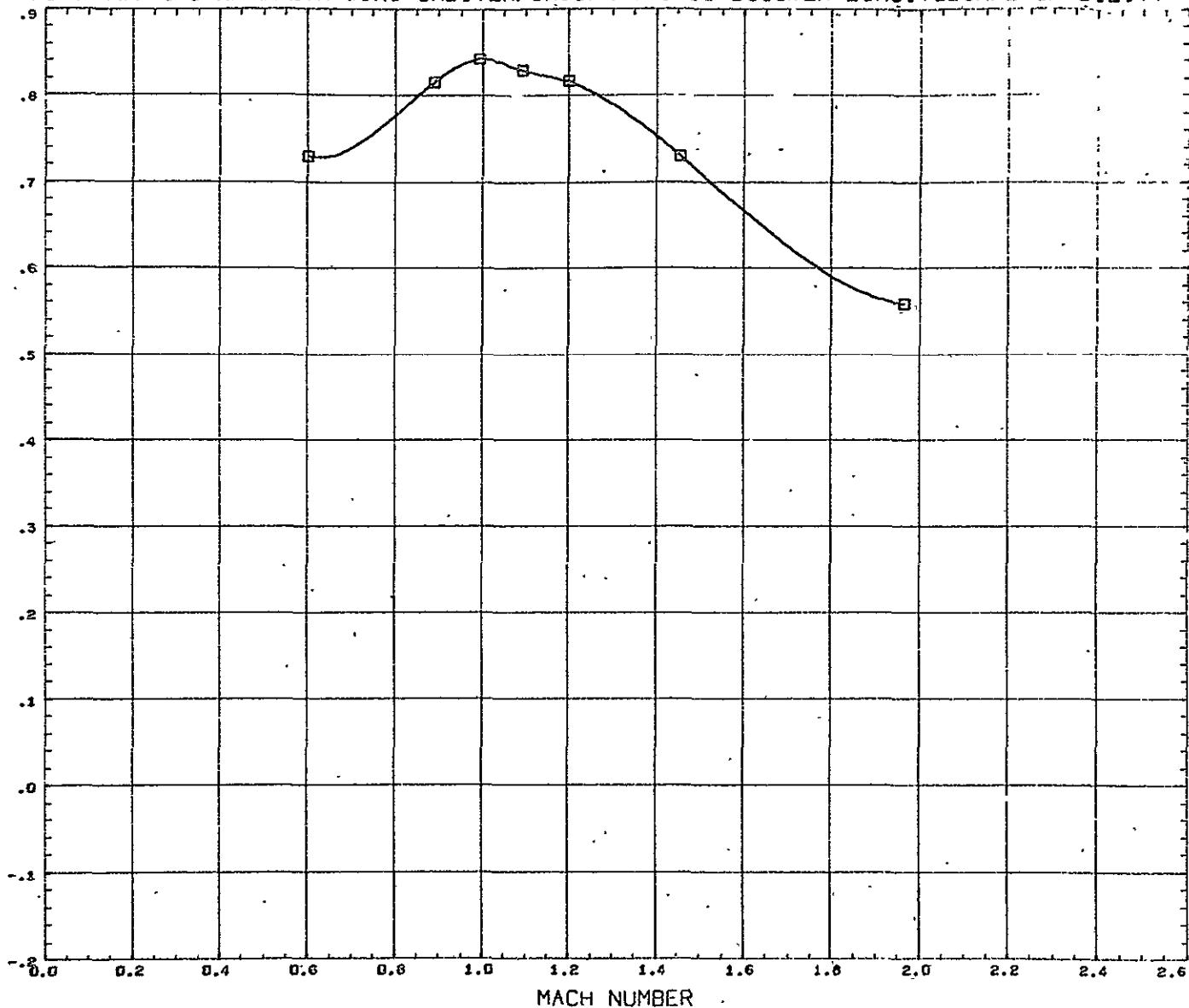
REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XNRF 5.2640 INCHES
YNRF 0.0000 INCHES
ZHNP 0.0330 INCHES
SCALE 0.0034

DATA MIST. CODE V

MSFC 476 NR HCRORB/S-ICBOOSTER BS+85W14E3V17 (B25071) 14 JAN 71 PAGE 111

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CL/M) PER DEGREE



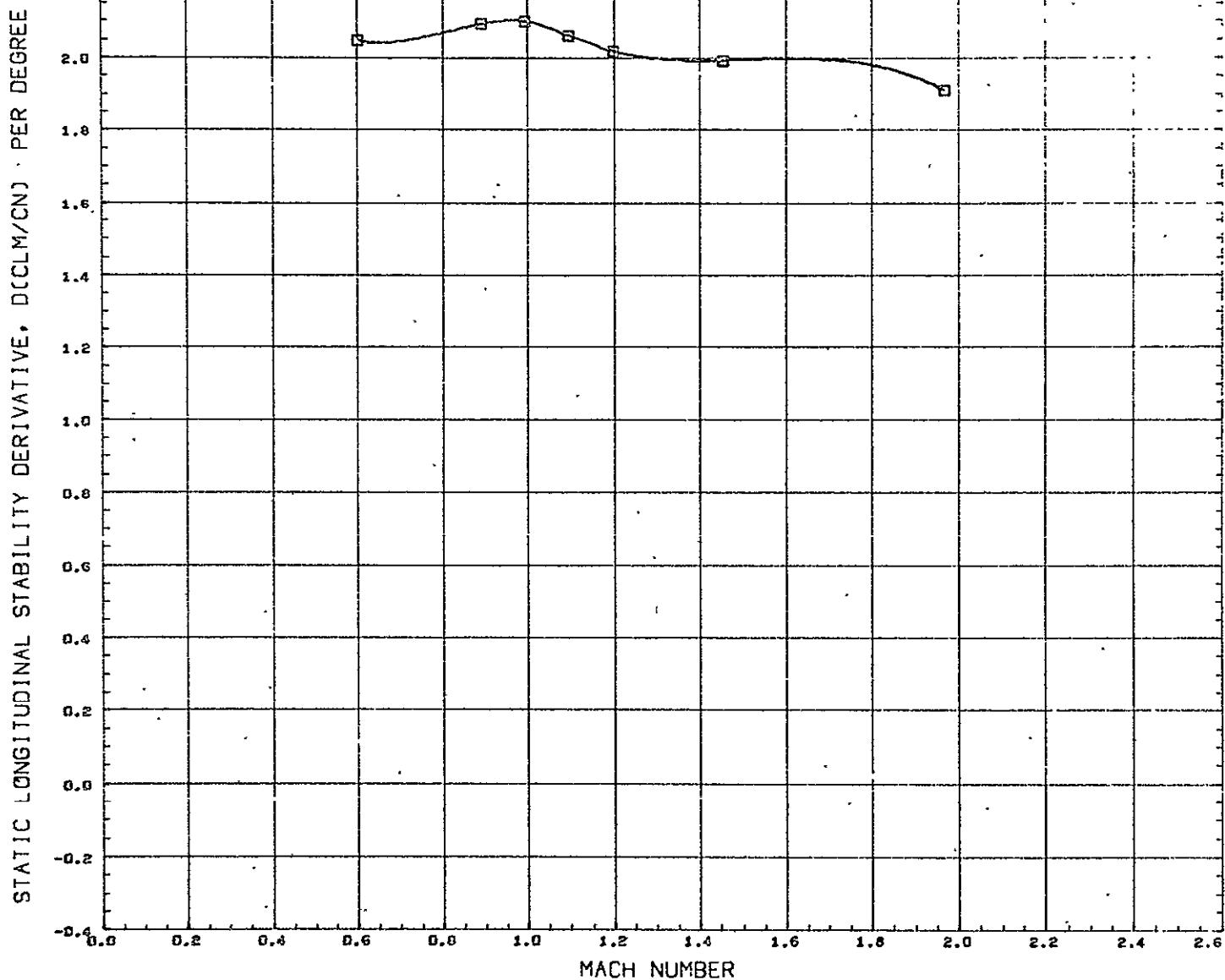
PARAMETRIC VALUES
BETA = 0.020 ORBINC 4.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YMRF 0.0000 INCHES
ZNRF 0.0330 INCHES
SCALE 0.0034 INCHES

DATA HIST. CODE V

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (B25071) 14 JAN 71 PAGE 112

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



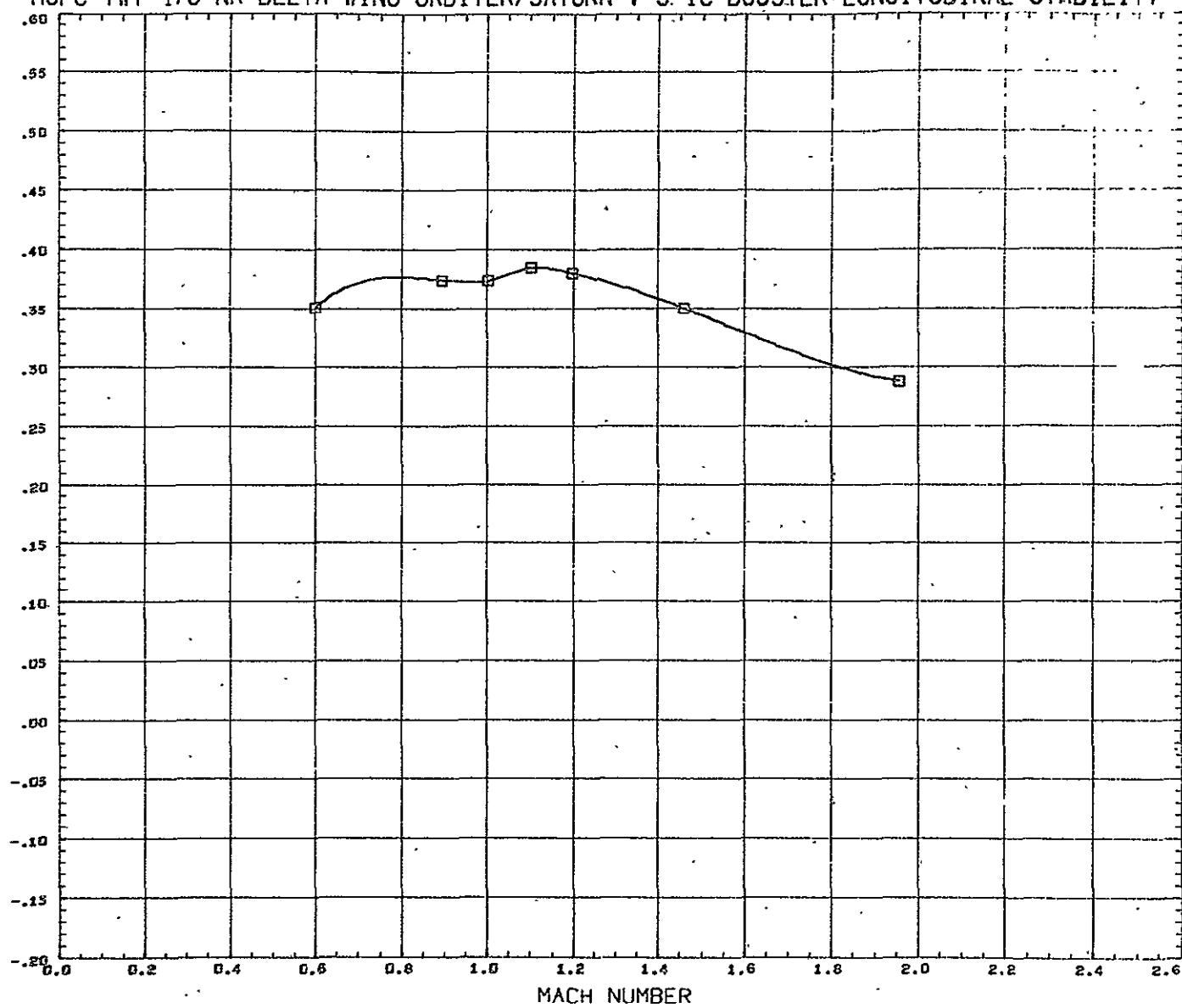
PARAMETRIC VALUES
BETA = -0.020 ORBINC 4.000

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRF 5.2640 INCHES
YMRF 0.0000 INCHES
ZMRF 0.0350 INCHES
SCALE 0.0034

DATA MIST. CODE V

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

NORMAL FORCE DERIVATIVE, $B(CN)$ PER DEGREE



PARAMETRIC VALUES
BETA 0.000 ORBIHC - 2.000

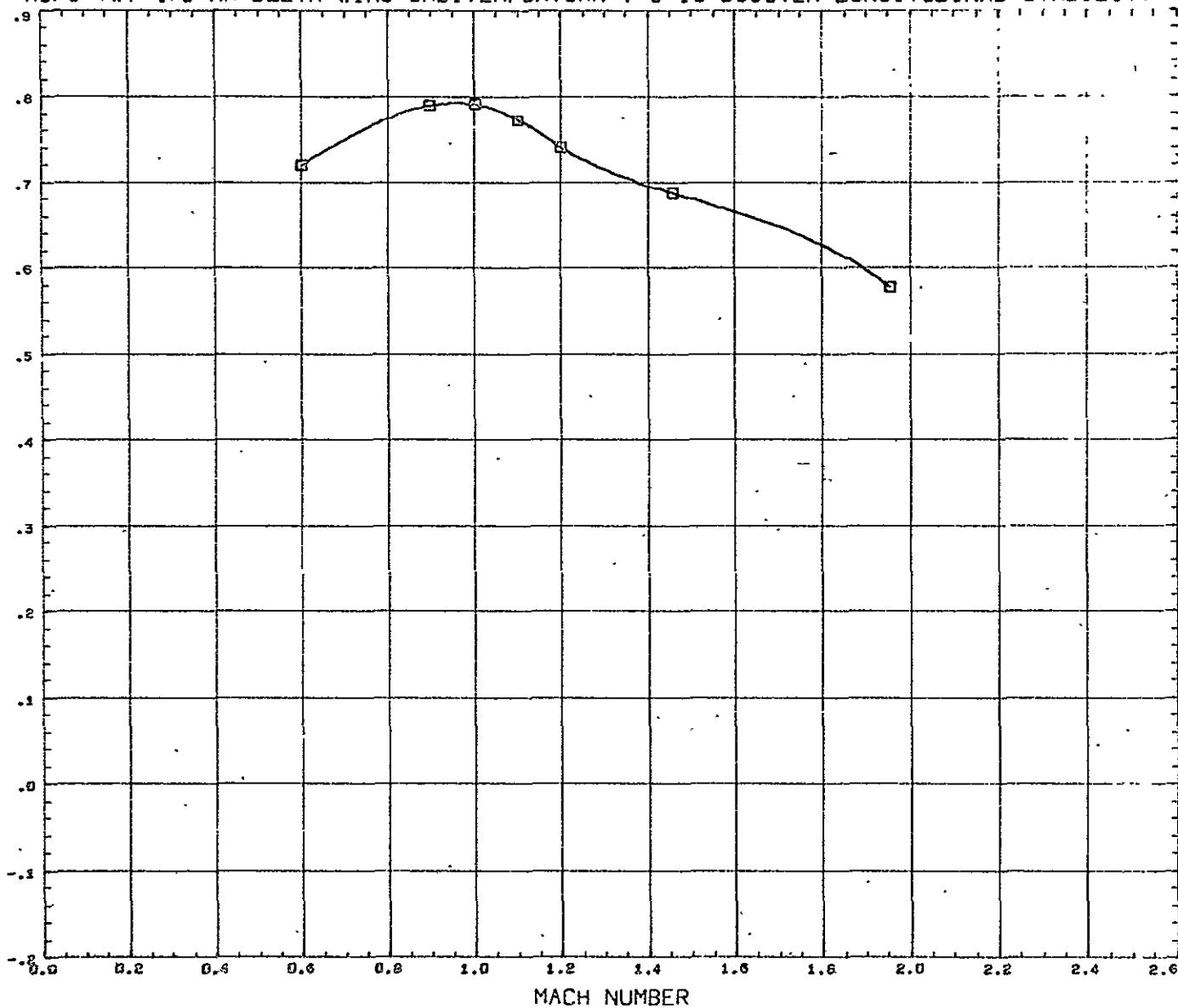
DATA HIST. CODE MMV

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XNRF 5.2640 INCHES
YNRP 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (B25081) 14 JAN 71 PAGE 114

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CCLM) PER DEGREE



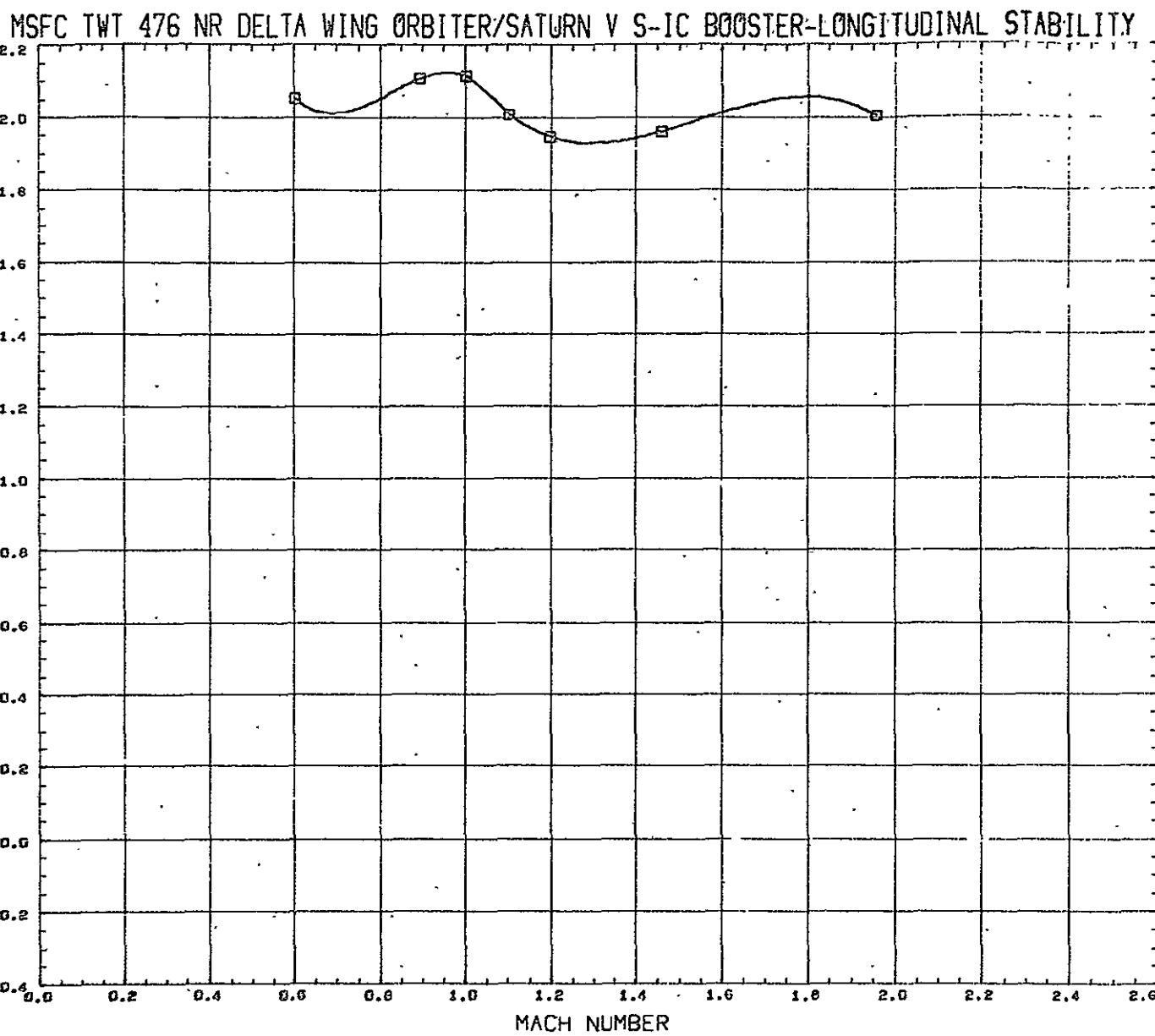
PARAMETRIC VALUES
BEYA 0.000 ORBINC - 2.000

REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE MMV

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (B25081) 14 JAN 71 PAGE 115

STATIC LONGITUDINAL STABILITY DERIVATIVE, $D(CLM/CN)$ PER DEGREE



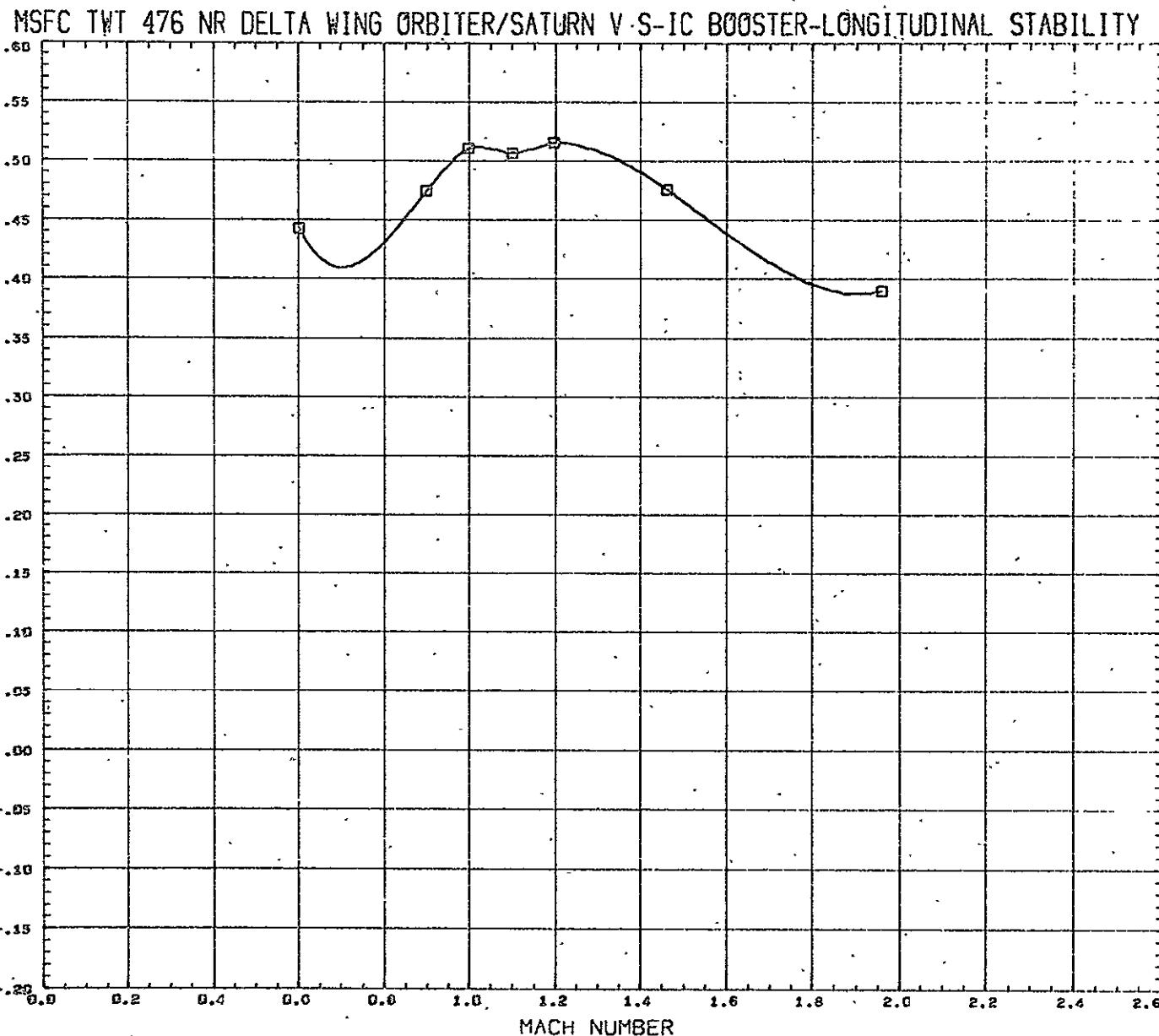
PARAMETRIC VALUES
BETA 0.000 ORBINC - 2.000

DATA MIST. CODE NNV

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRF 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRF 0.0330 INCHES
SCALE 0.0034

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (B25081) 14 JAN 71 PAGE 116

NORMAL FORCE DERIVATIVE, D(CN) PER DEGREE



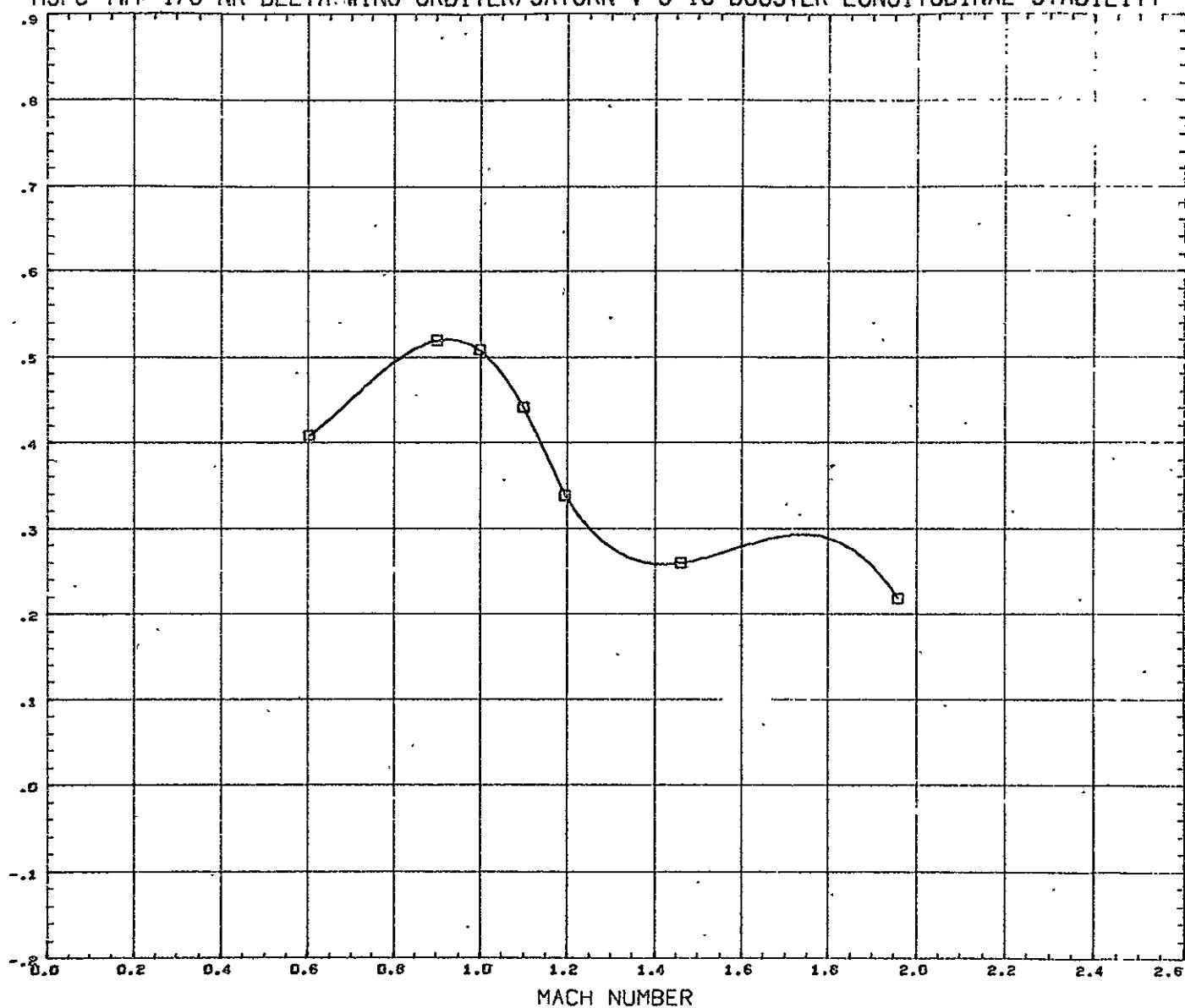
DATA MIST. CODE NMV

REFERENCE INFORMATION

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YMRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

PITCHING MOMENT DERIVATIVE, D(CLM) PER DEGREE



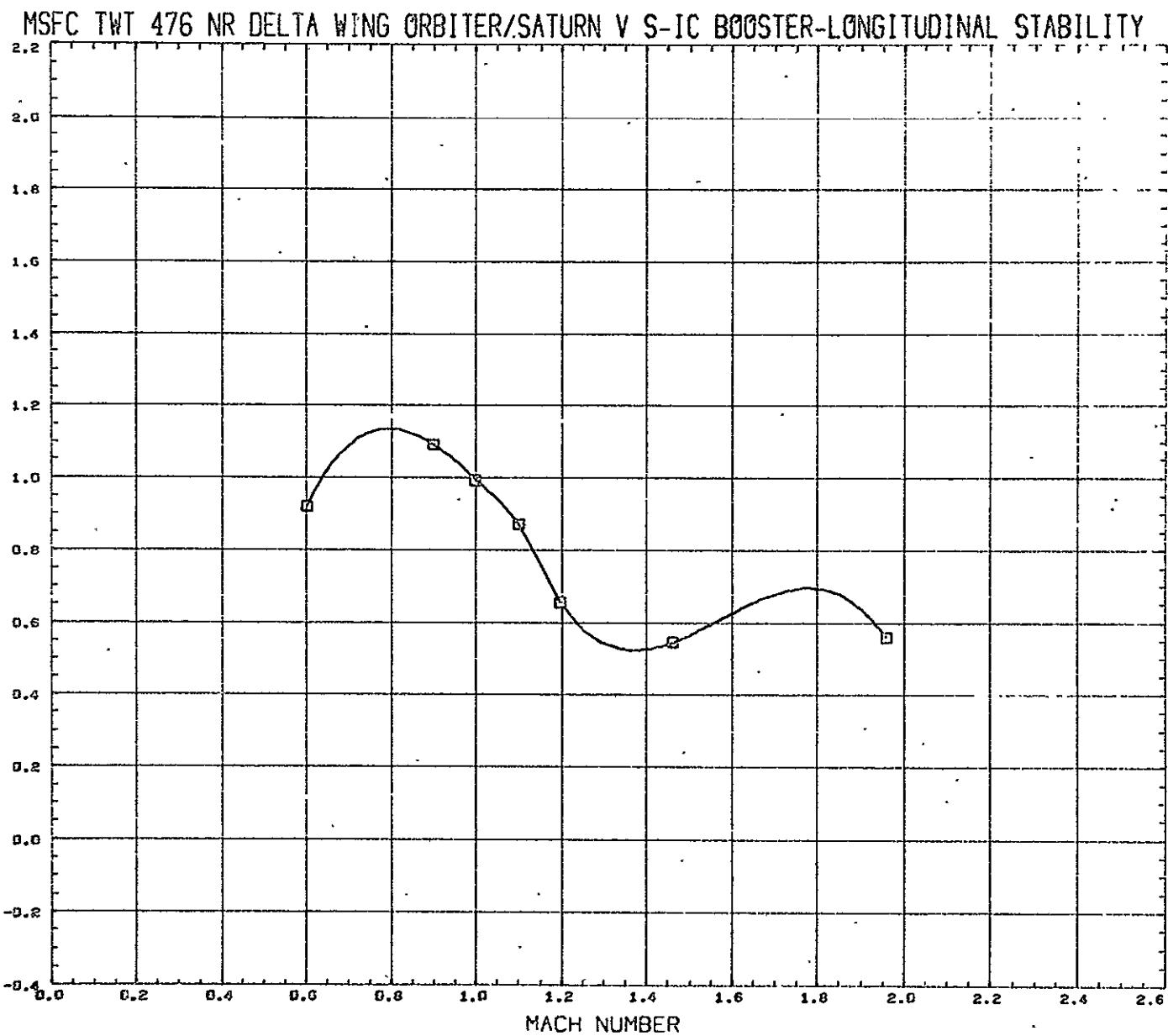
PARAMETRIC VALUES
BETA 0.000 ORBINC 1.000

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034 INCHES

DATA HIST. CODE NHV

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (B25091) 14 JAN 71 PAGE 118

STATIC LONGITUDINAL STABILITY DERIVATIVE. DCLM/CN) PER DEGREE



PARAMETRIC VALUES
BETA 0.000 ORBINC 1.000

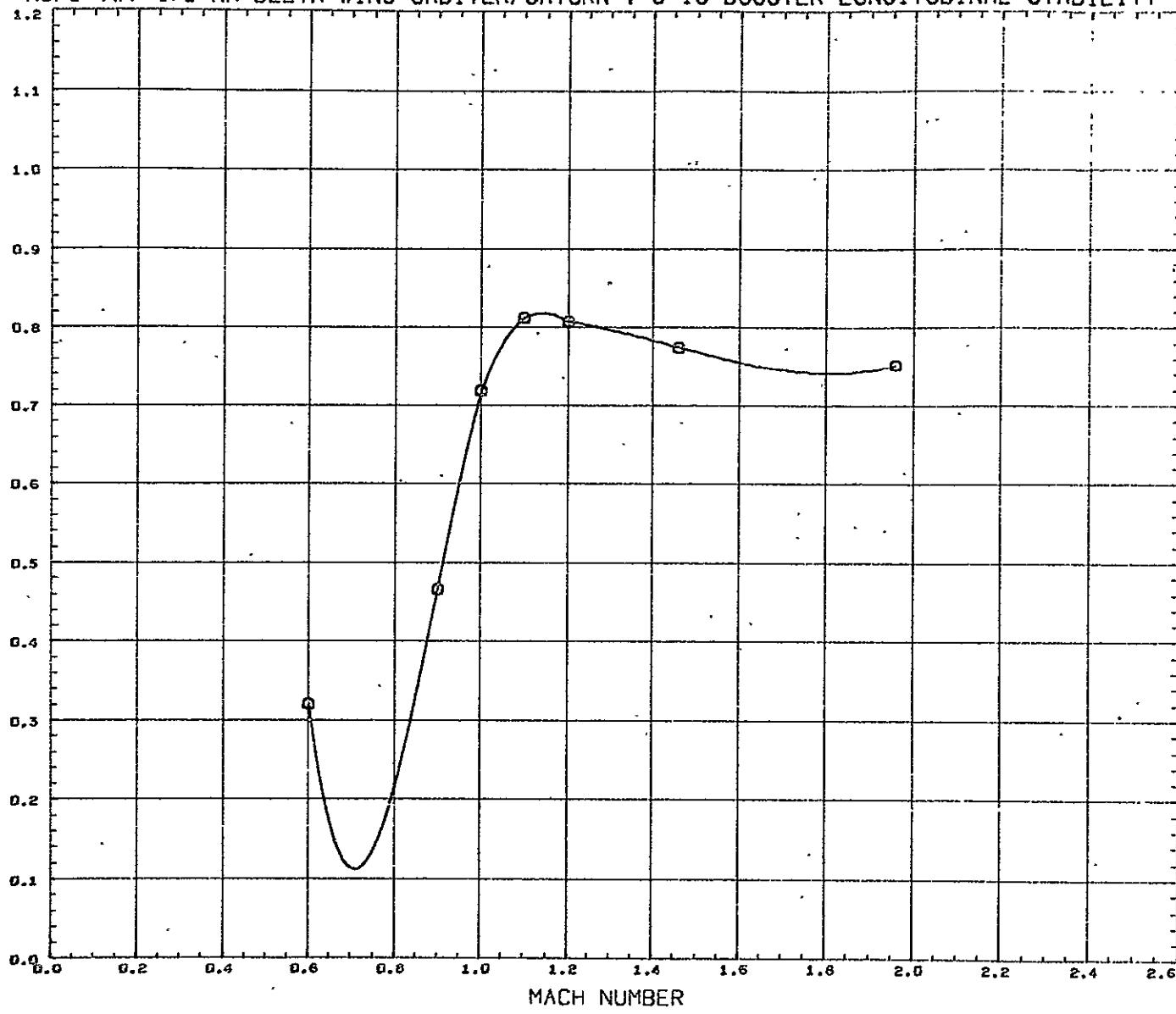
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REFB 1.3330 INCHES
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YMRF 0.0000 INCHES
ZMRP 0.0350 INCHES
SCALE 0.0034

DATA HIST. CODE MMV

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (B25091) 14 JAN 71 PAGE 119

FOREBODY AXIAL FORCE COEFFICIENT, C_AF

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL ALFMA PARAMETRIC VALUES
O 0.000 BETA 0.020 ORBINC 1.000

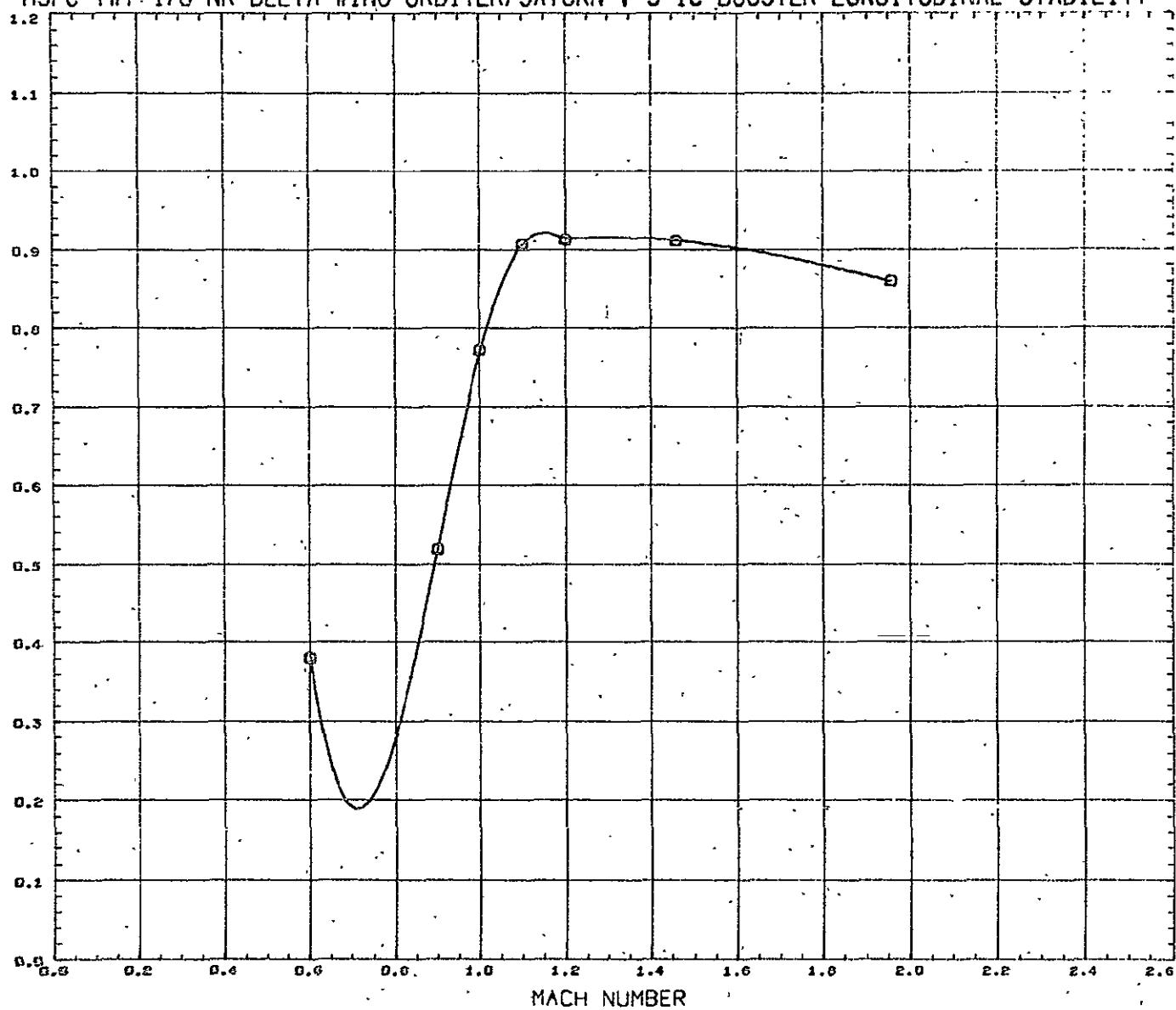
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HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MHI

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (N25021) 14 JAN 71 PAGE 120

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



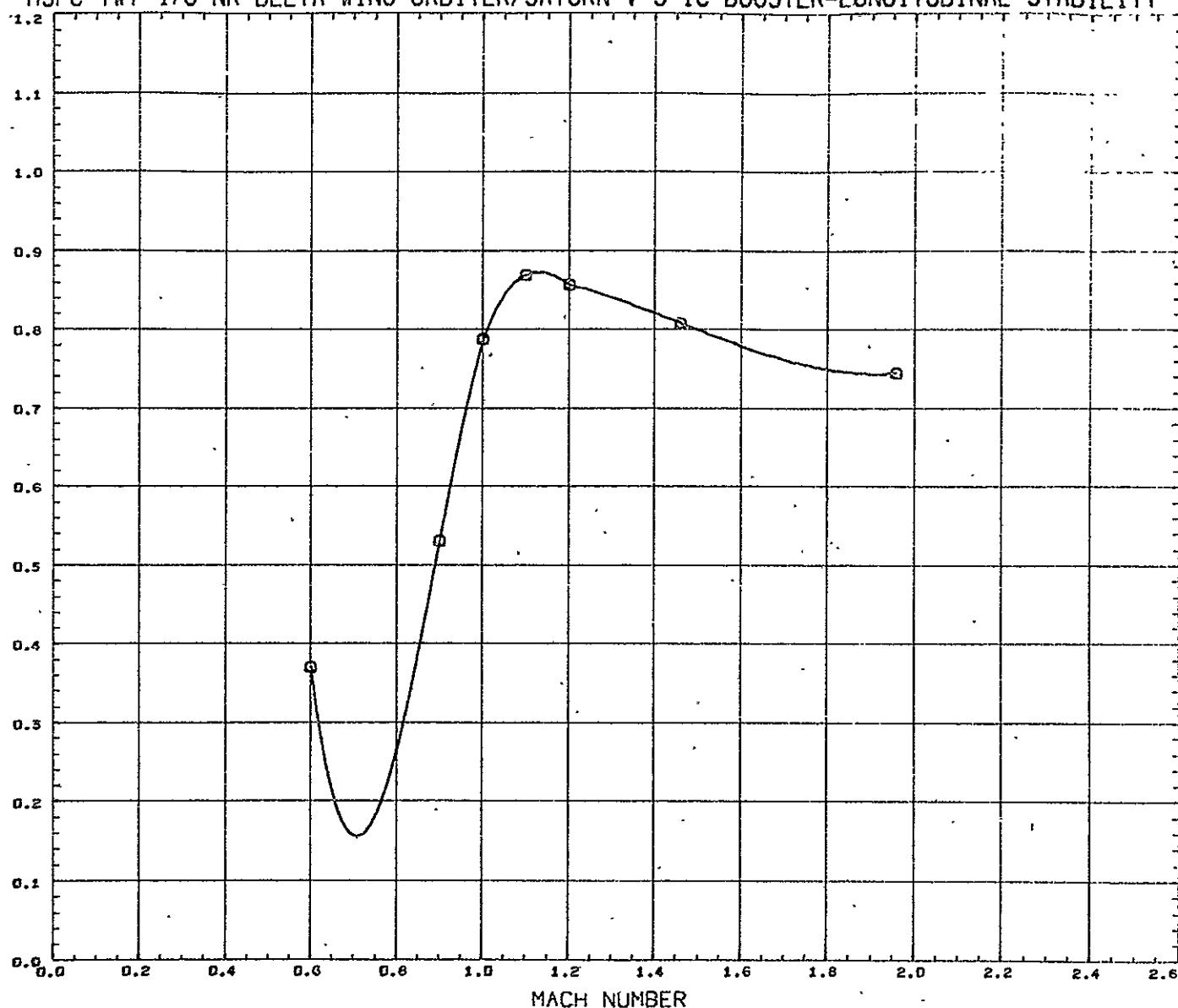
SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA - 0.020 ORBINC 4.000

DATA HIST. CODE NHI

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 REFB 1.3330 INCHES
 XMRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



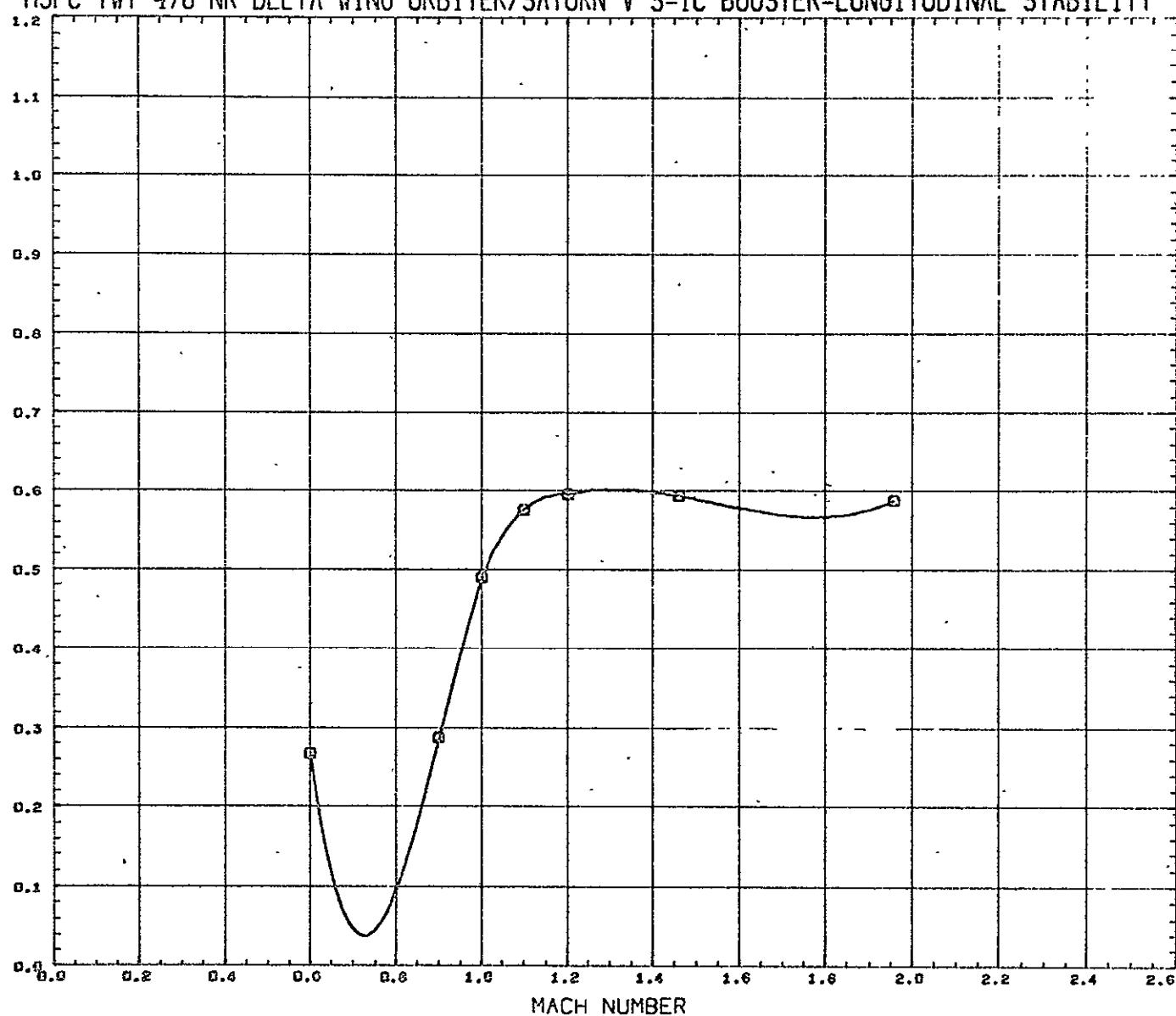
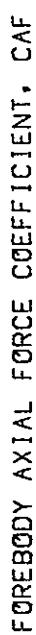
SYMBOL ALFNA PARAMETRIC VALUES
Q 0.000 BETA 0.010 ORBINC - 2.000

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

DATA HIST. CODE MMJ

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (N25041) 14 JAN 71 PAGE 122

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



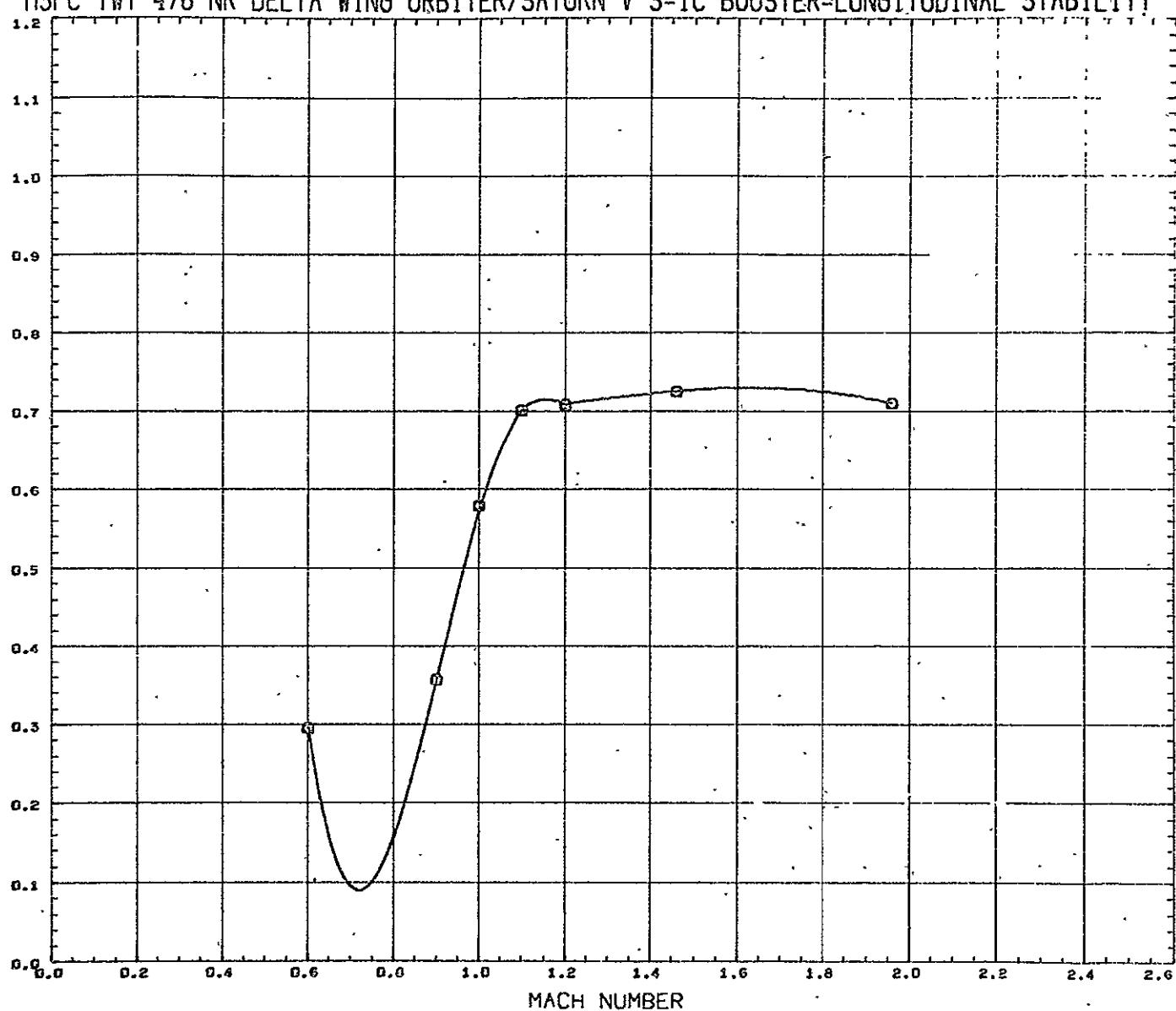
SYMBOL	ALPHA	BETA	PARAMETRIC VALUES
Q	0.000		0.010 ORBINC 1.000

REFERENCE INFORMATION		
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REFB	1.3330	INCHES
XHRF ^t	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHI

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



SYMBOL ALPHA BETA PARAMETRIC VALUES
O 0.000 - 0.020 ORBINC 4.000

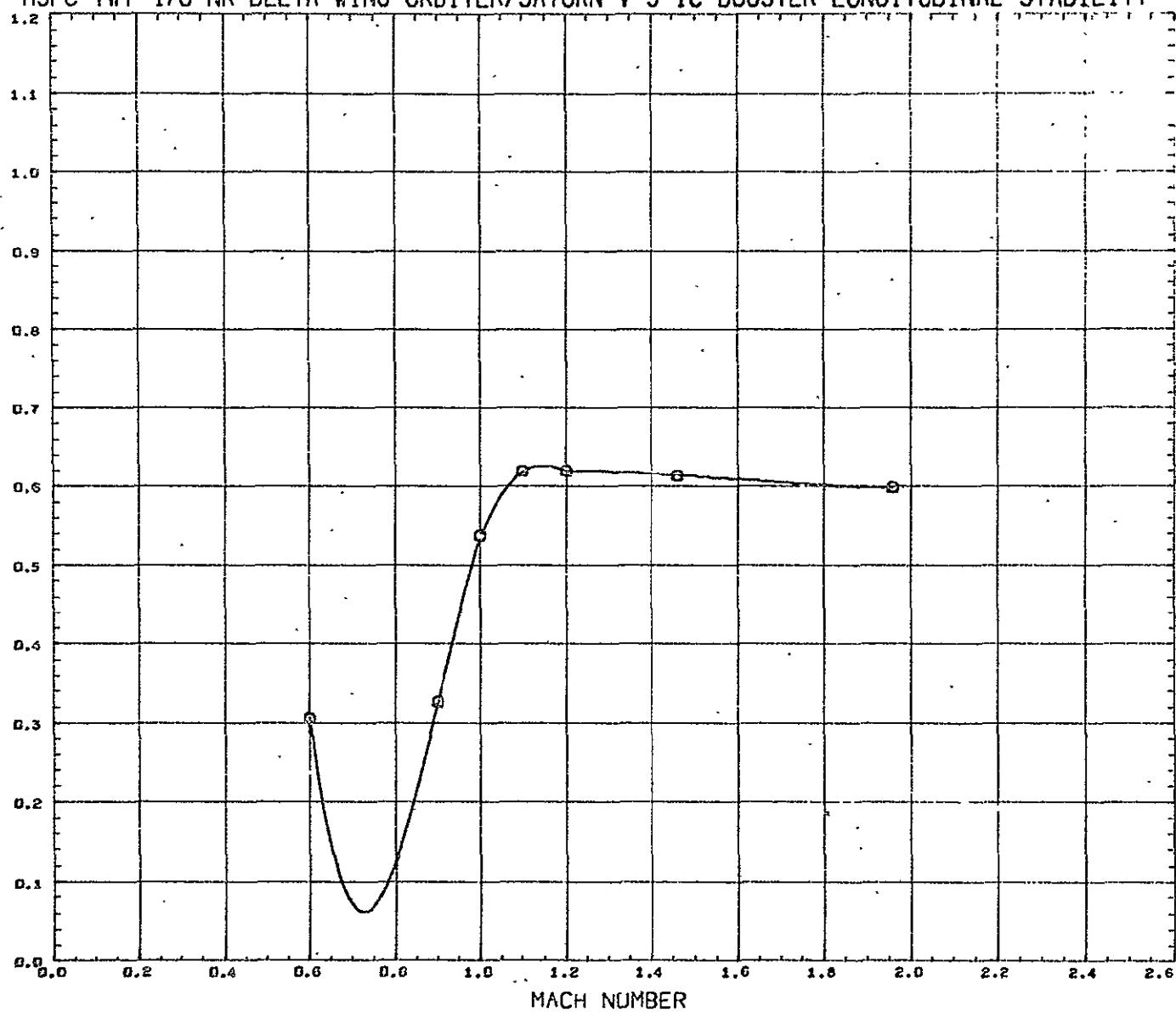
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REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

DATA HIST. CODE I

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (N25071) 14 JAN 71 PAGE 124

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA 0.000 ORBINC - 2.000

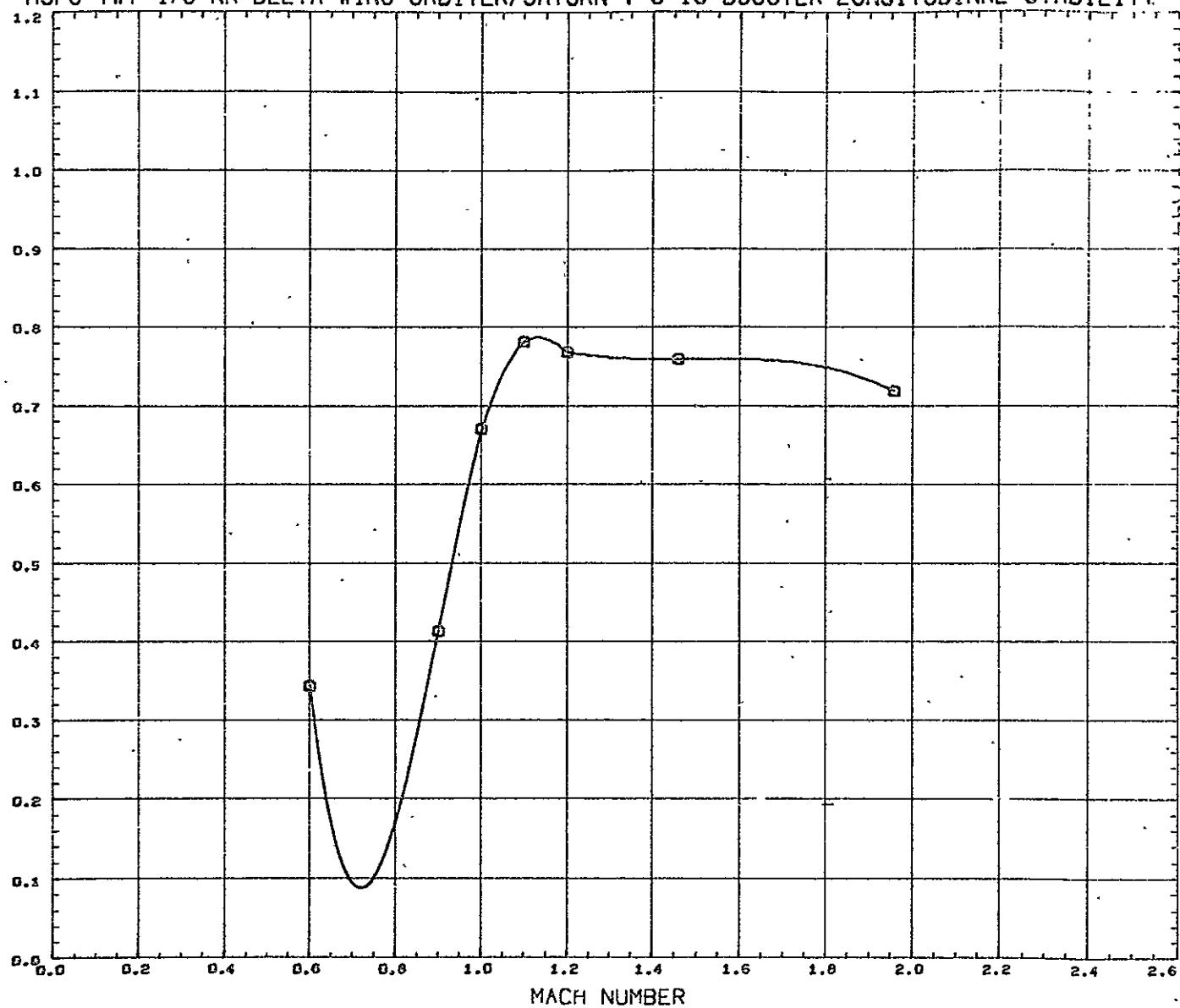
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 REFB. 1.3330 INCHES
 XHRF. 5.2640 INCHES
 YHRF. 0.0000 INCHES
 ZHRF. 0.0330 INCHES
 SCALE. 0.0034

DATA HIST. CODE HHI

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (N25081) 14 JAN 71 PAGE 125

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



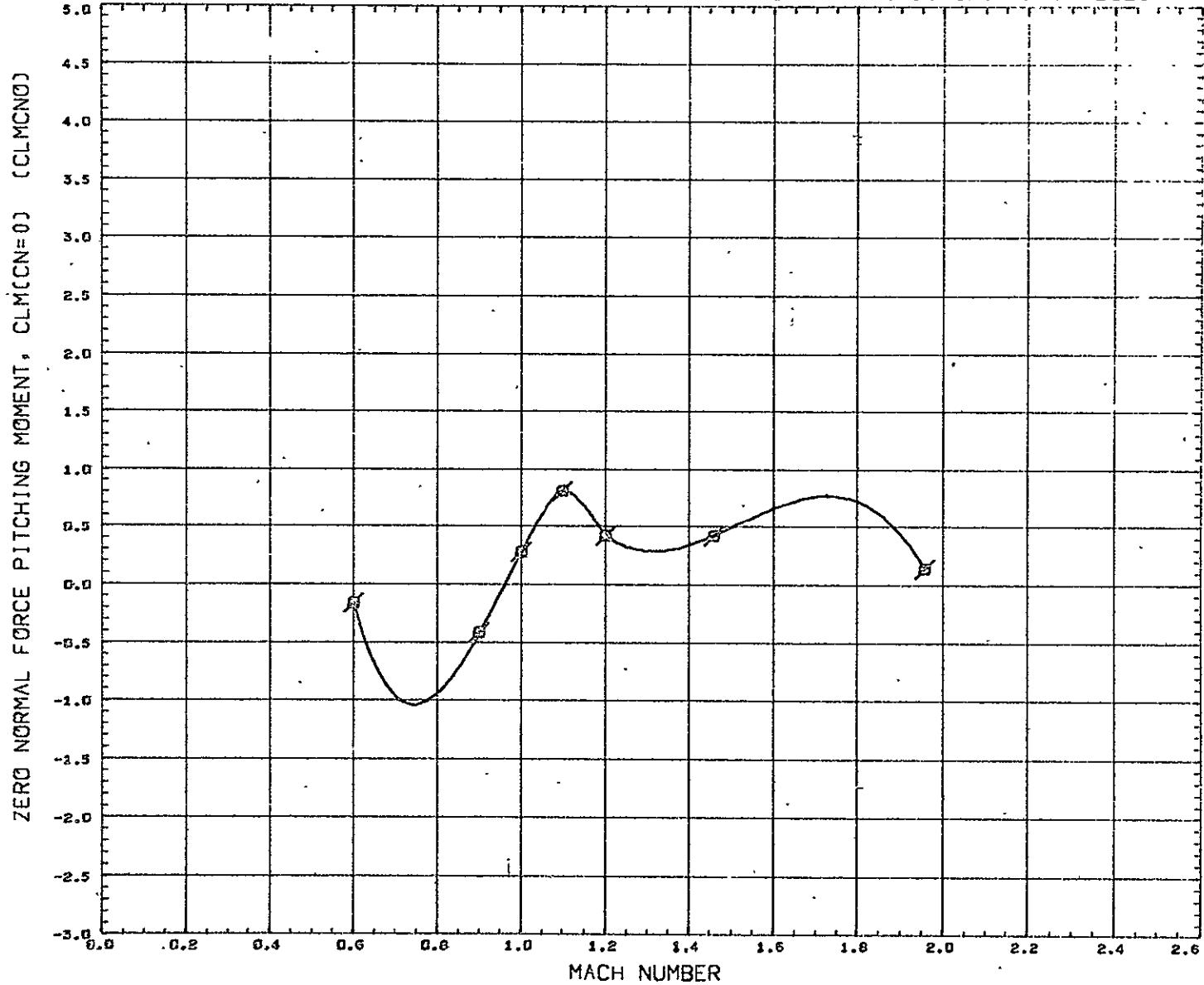
SYMBOL ALPH_A BEYA PARAMETRIC VALUES
 O 0.000 0.000 ORBINC 1.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA MIST. CODE MM1

MSFC 476 NR HCR0RB/S-ICBOOSTER BF2S+B5W14E3V17 (N25091) 14 JAN 71 PAGE 126

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

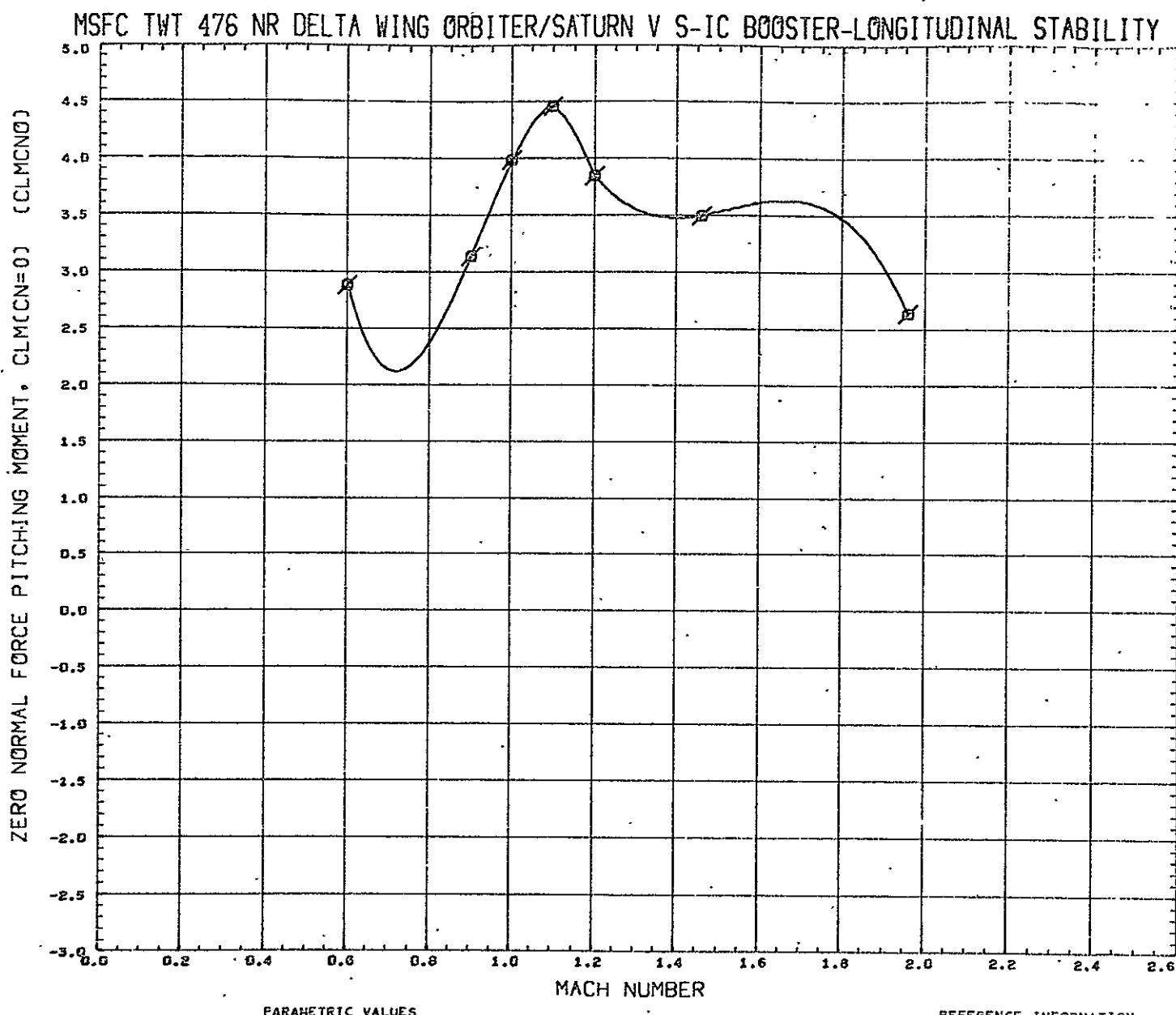


PARAMETRIC VALUES
BETA 0.029 ORBINC 1.000

REFERENCE INFORMATION
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SCALE 0.0034 INCHES

DATA HIST. CODE NMIF

4



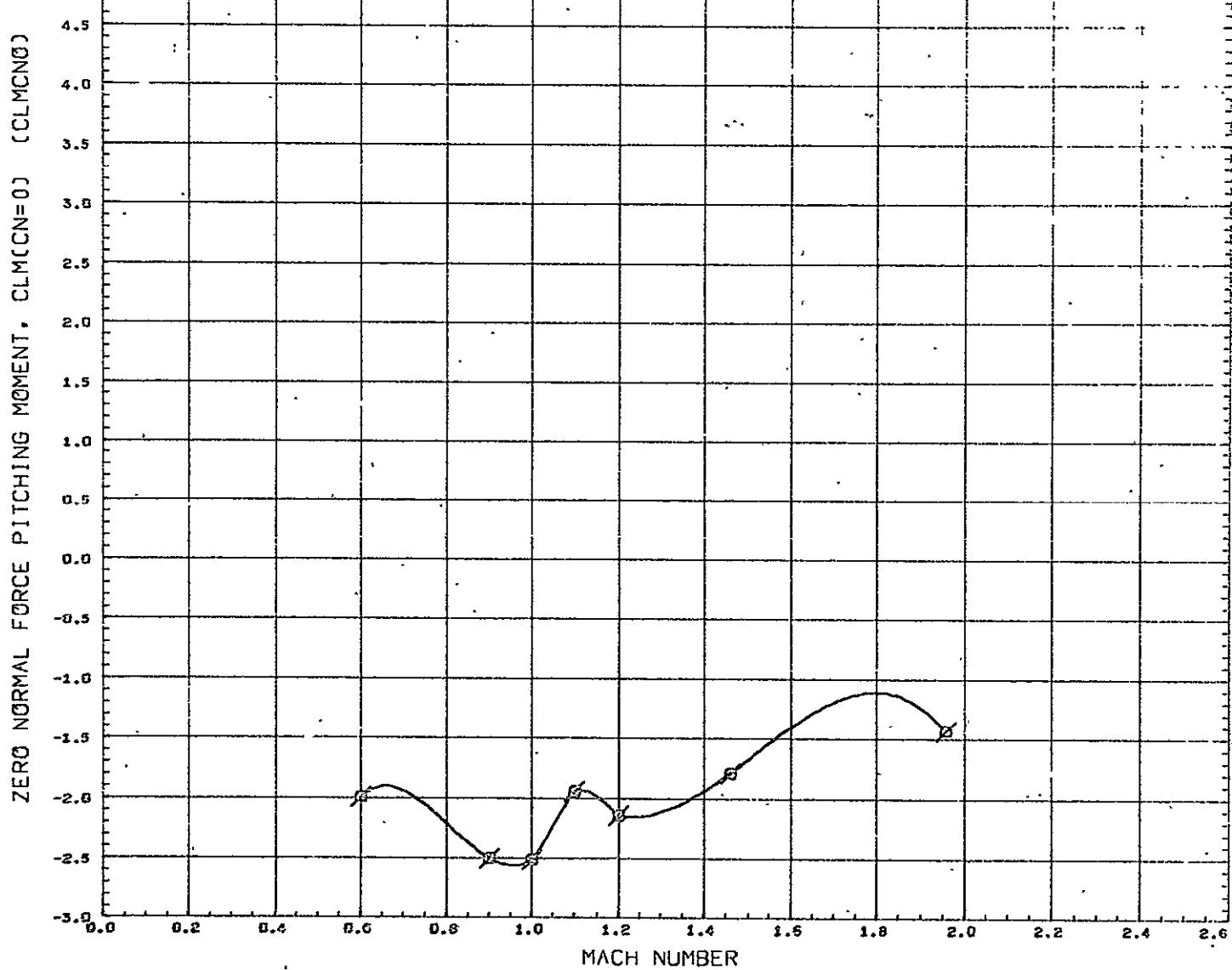
PARAMETRIC VALUES
BETA = 0.020 ORBINC = 4.000

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XHRP 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034

DATA HIST. CODE MHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25031) 14 JAN 71 PAGE 128

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

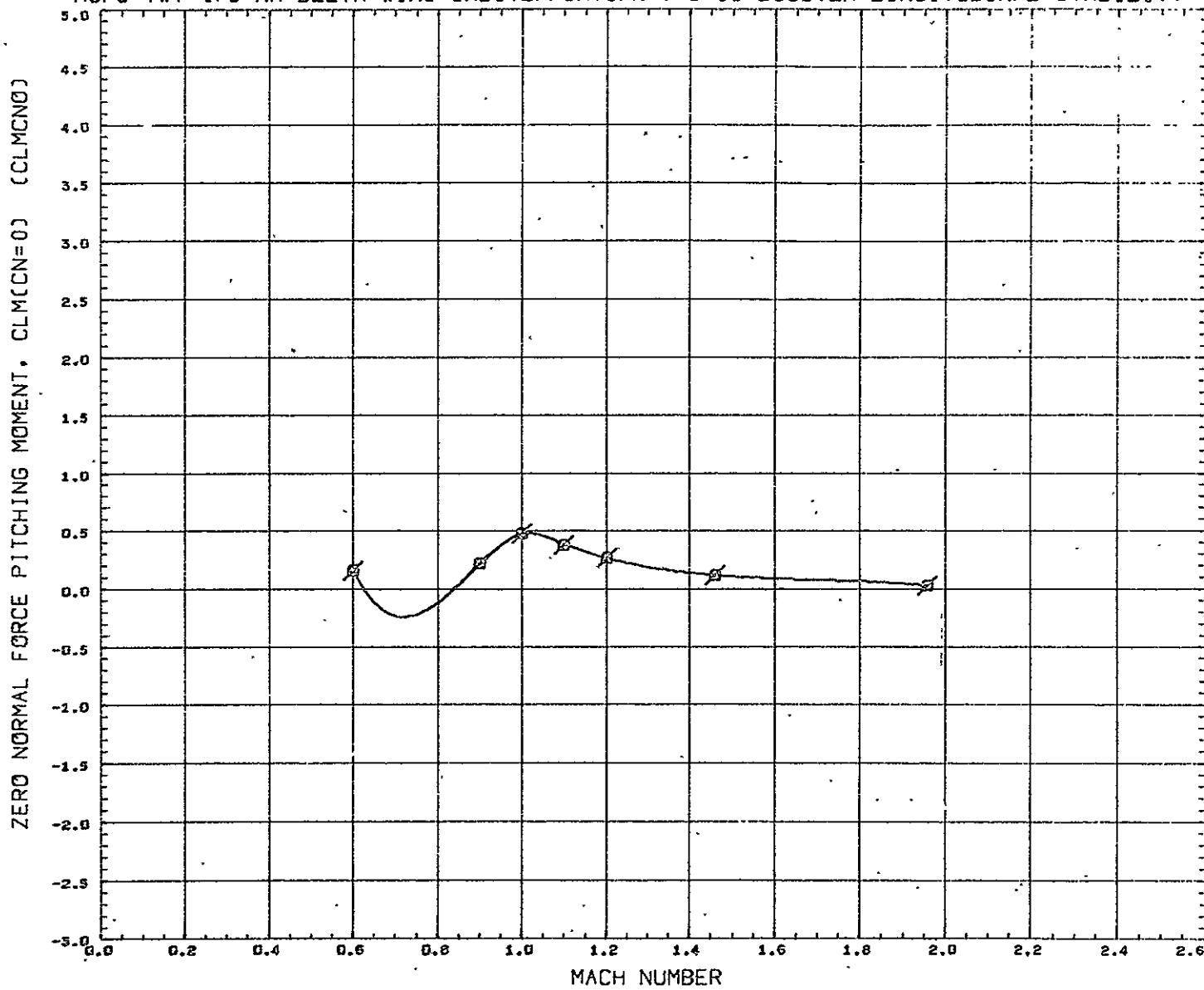
BETA 0.010 ORBINC - 2.000

DATA MIST. CODE MHIF

REFERENCE INFORMATION

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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHFF	5.2640	INCHES
YHFF	0.0000	INCHES
ZHFF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.010 ORBINC 1.000

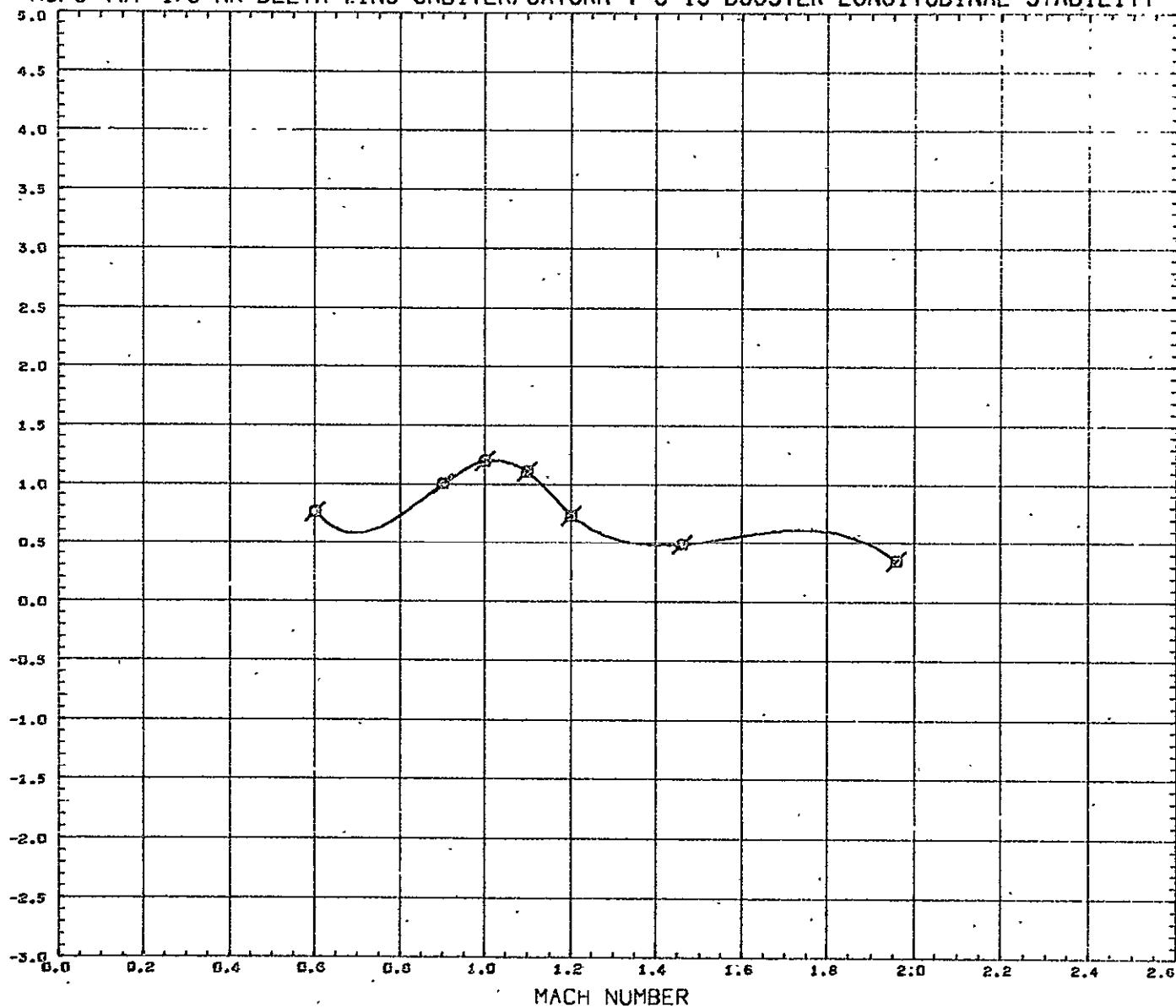
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034

DATA HIST. CODE MHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (A25061) 14 JAN 71 PAGE 130

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

ZERO NORMAL FORCE PITCHING MOMENT, CLM(CN=0) [CCLMCN0]

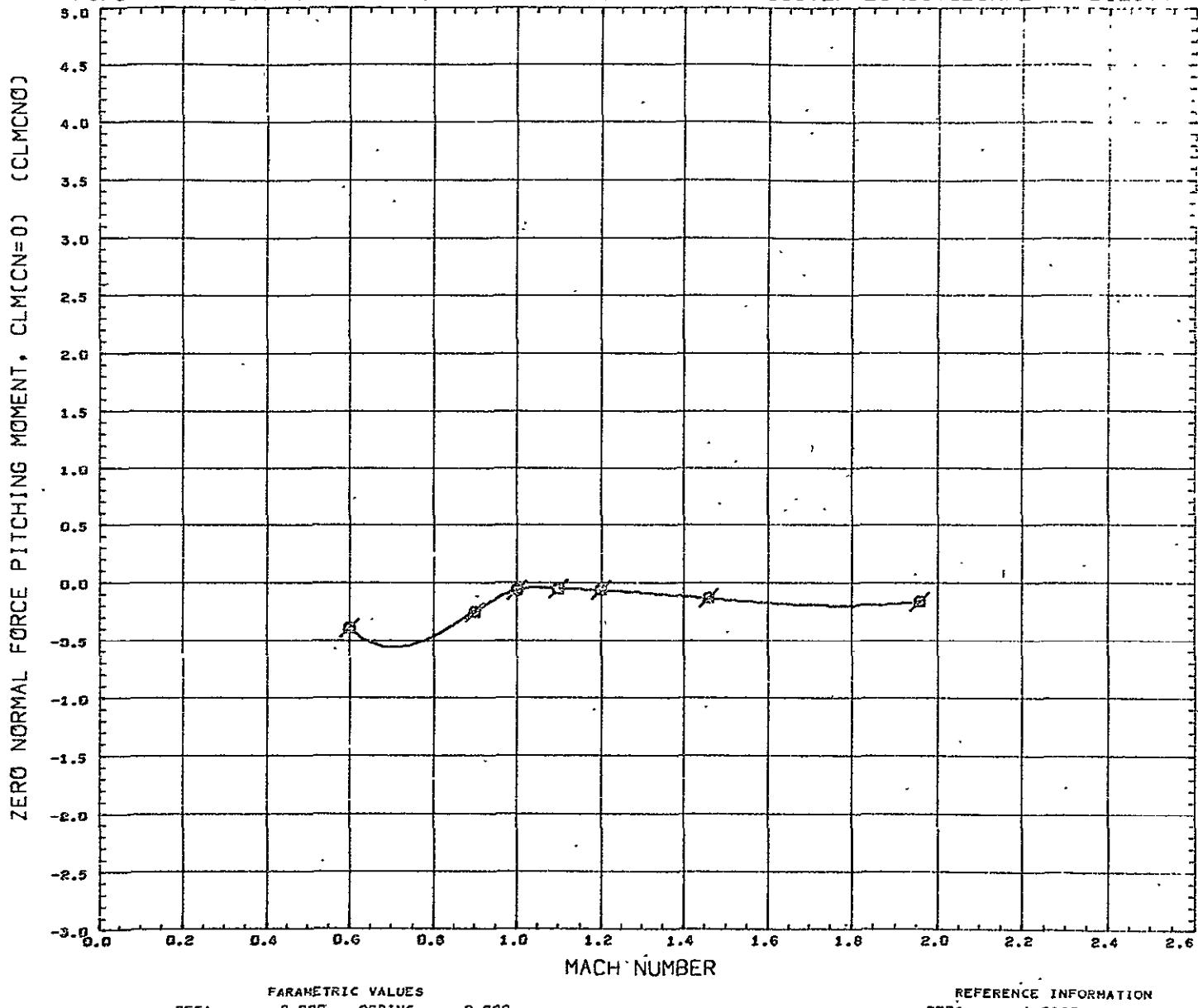


PARAMETRIC VALUES
BETA = 0.020 ORBINC 4.000

DATA HIST. CODE IFH

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YMRP 0.0000 INCHES
ZHFP 0.0330 INCHES
SCALE 0.0034 INCHES

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.000 ORBINC - 2.000

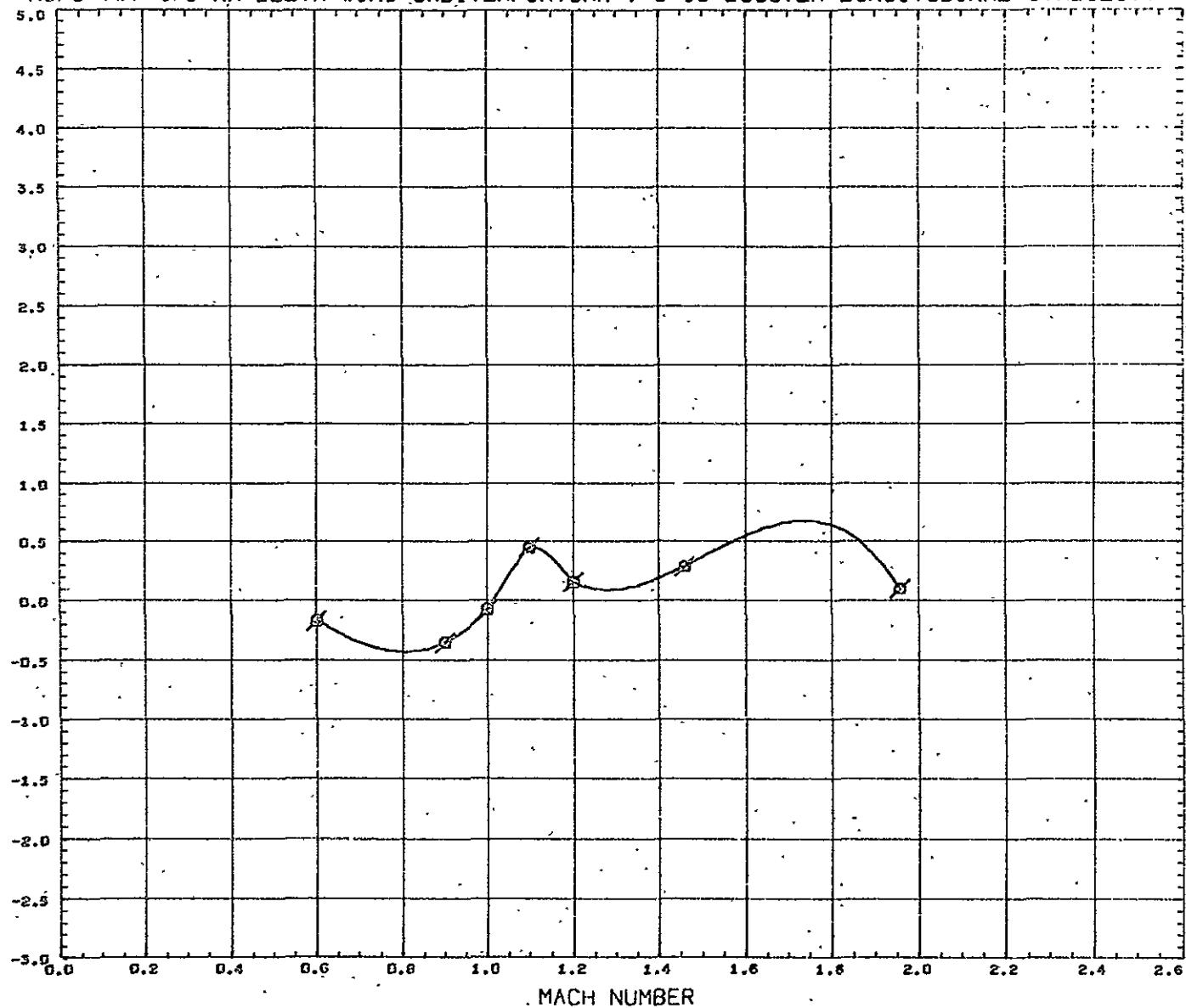
DATA MAST. CODE MMIF

REFERENCE INFORMATION

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XHRF	5.2640	INCHES	
YHRF	0.0000	INCHES	
ZHRF	0.0330	INCHES	
SCALE	0.0034	INCHES	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

ZERO NORMAL FORCE PITCHING MOMENT, CLM(CN=0) [CLMCN0]



PARAMETRIC VALUES

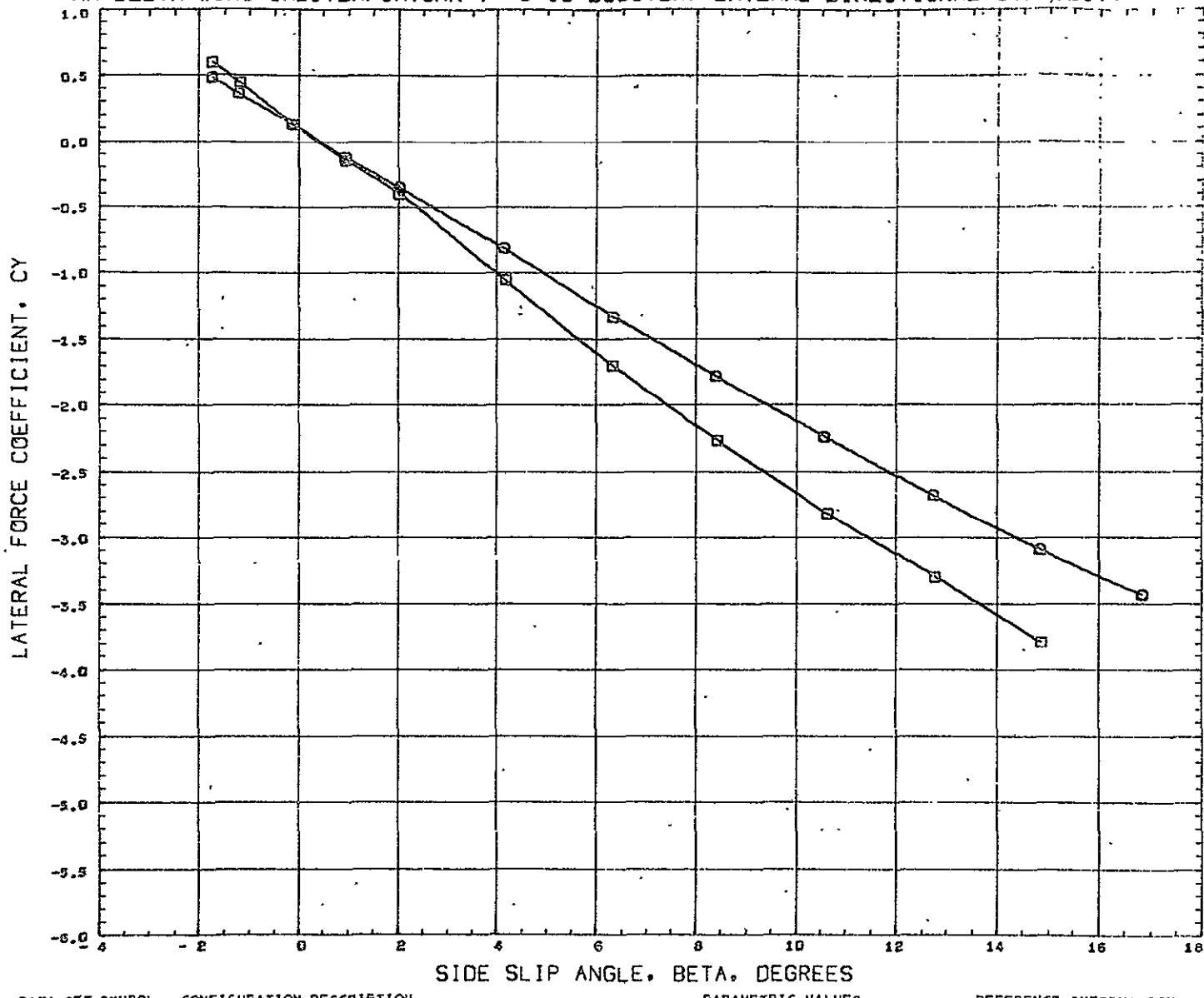
BETA 0.000 ORBINC 1.000

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NHIF

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

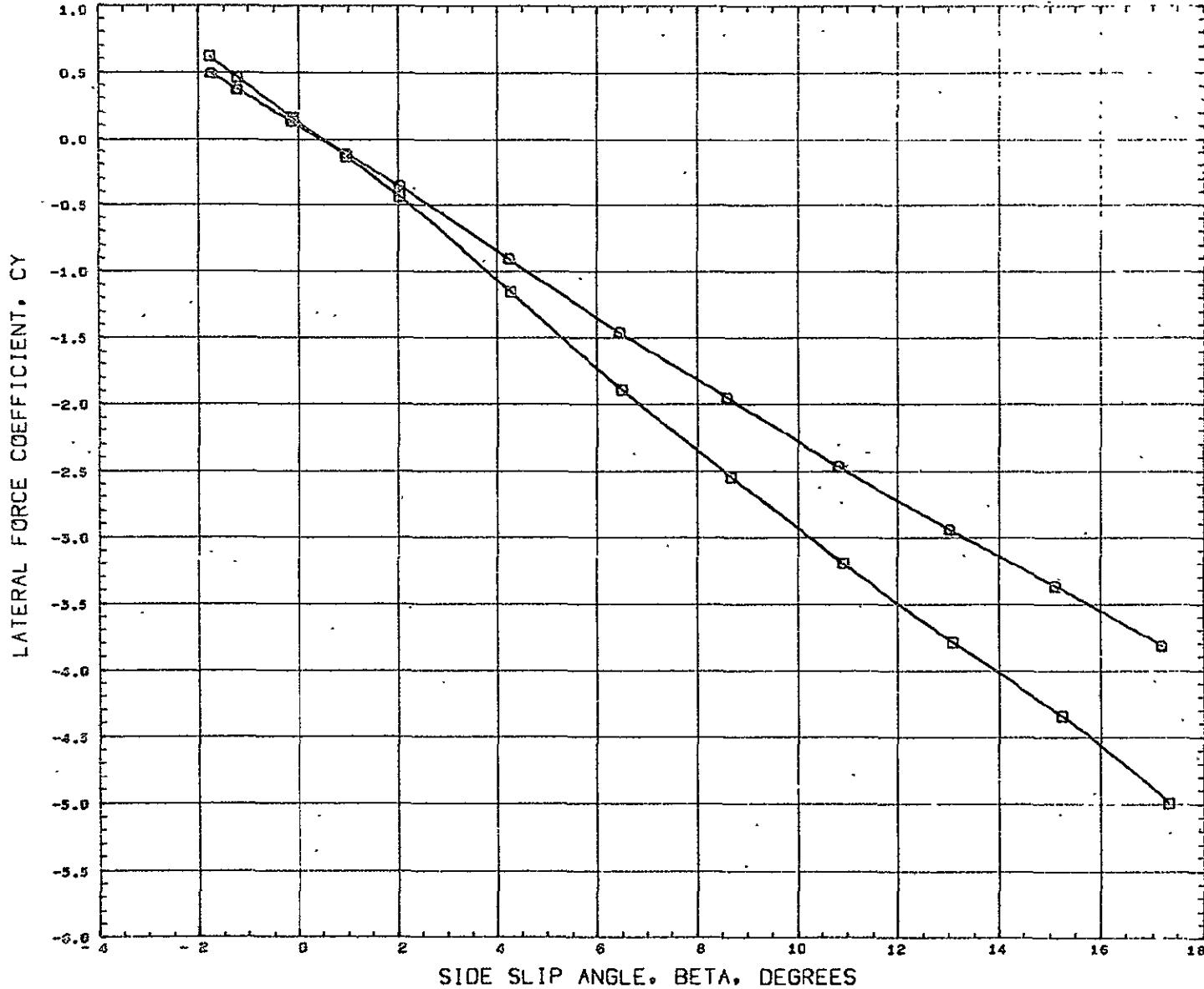
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REFERENCE INFORMATION

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YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25093) O NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

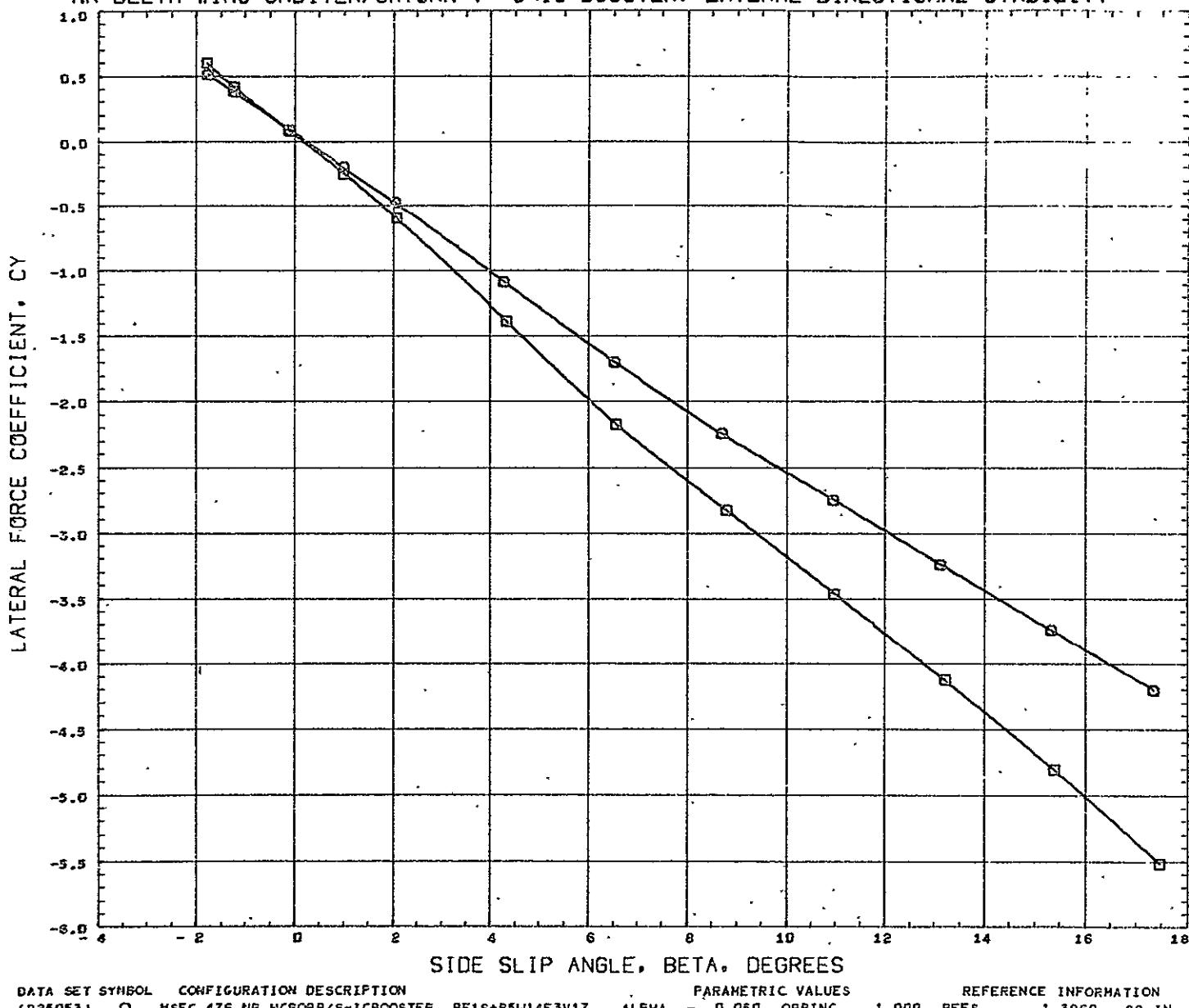
PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XMRF 5.2640 INCHES
YMRF 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

MACH 0.699

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

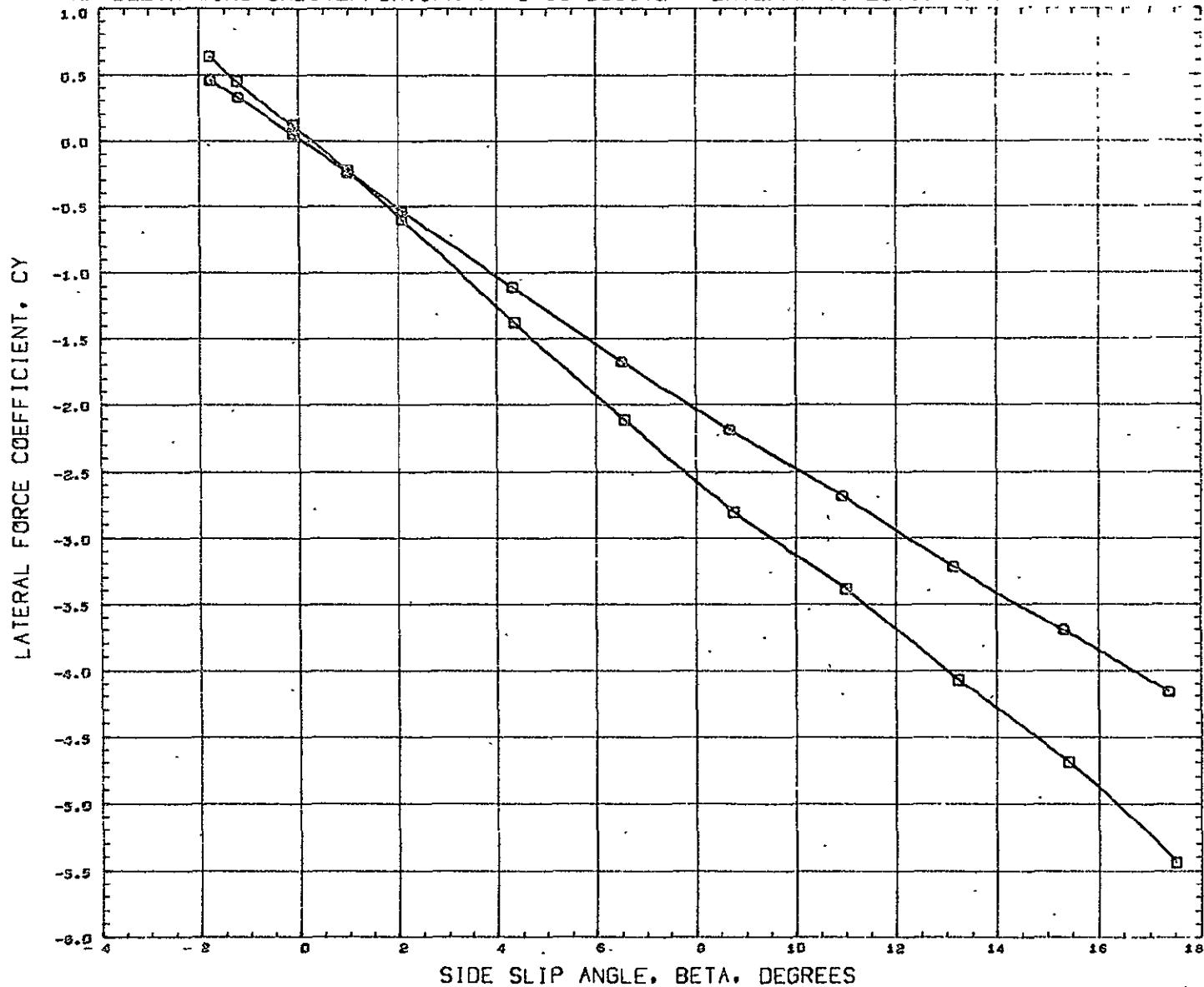
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REFERENCE INFORMATION

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XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O HSFC 475 NR MCROB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ HSFC 476 NR MCROB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

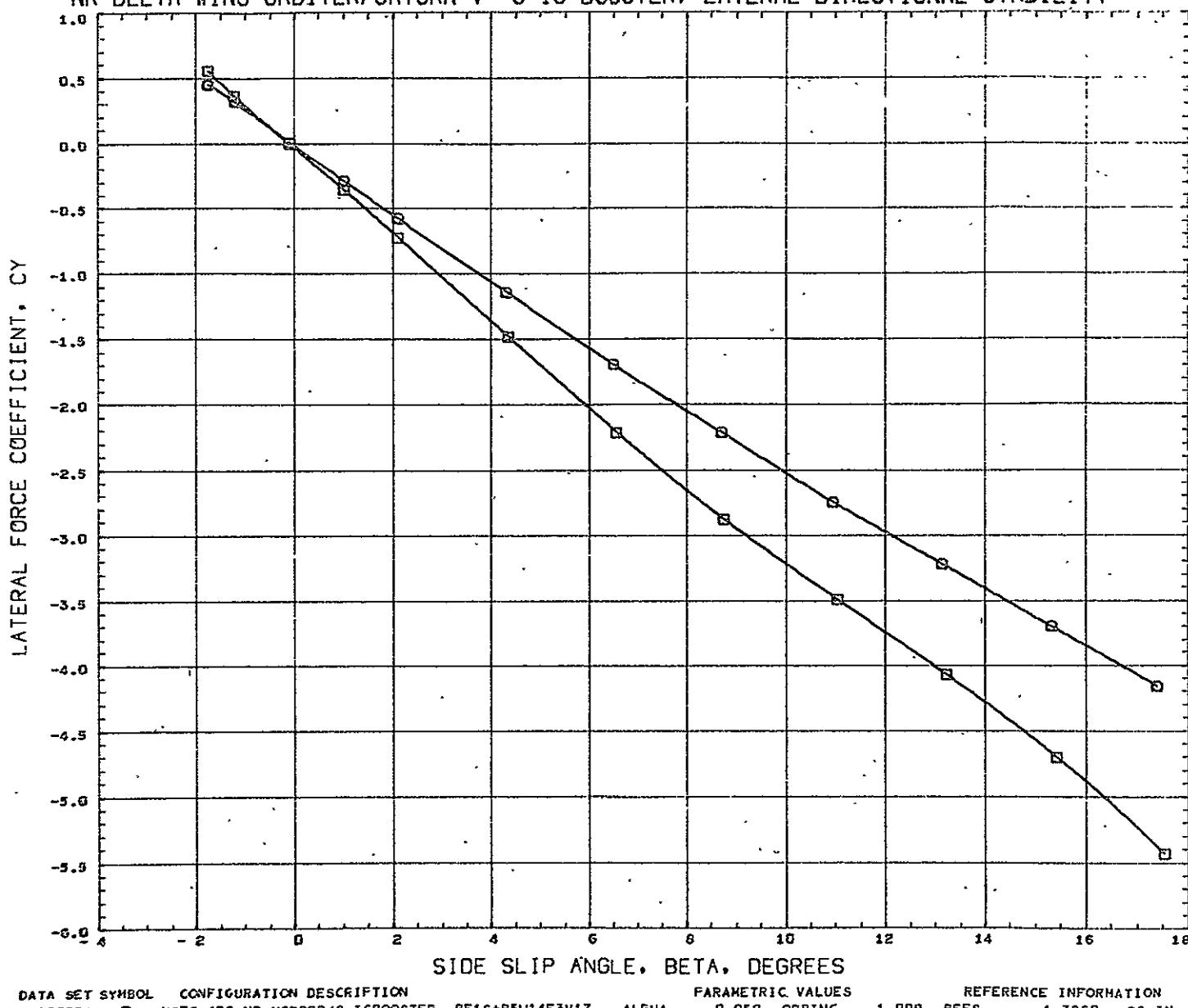
REFERENCE INFORMATION

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XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(CR25053) O NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (CR25093) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

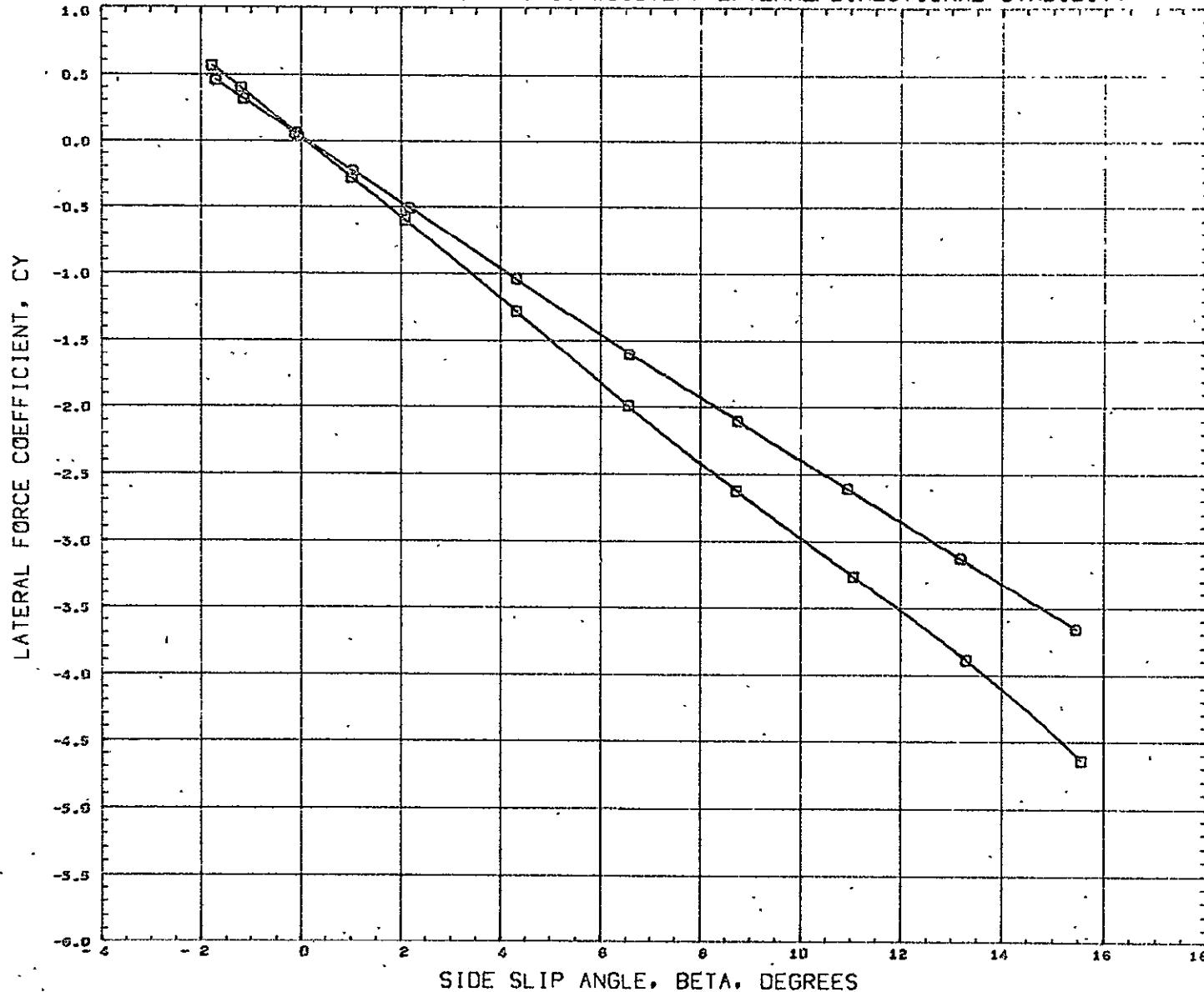
ALPHA = 0.050 ORBINC

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

MACH 1.196

PAGE 138

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER. LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

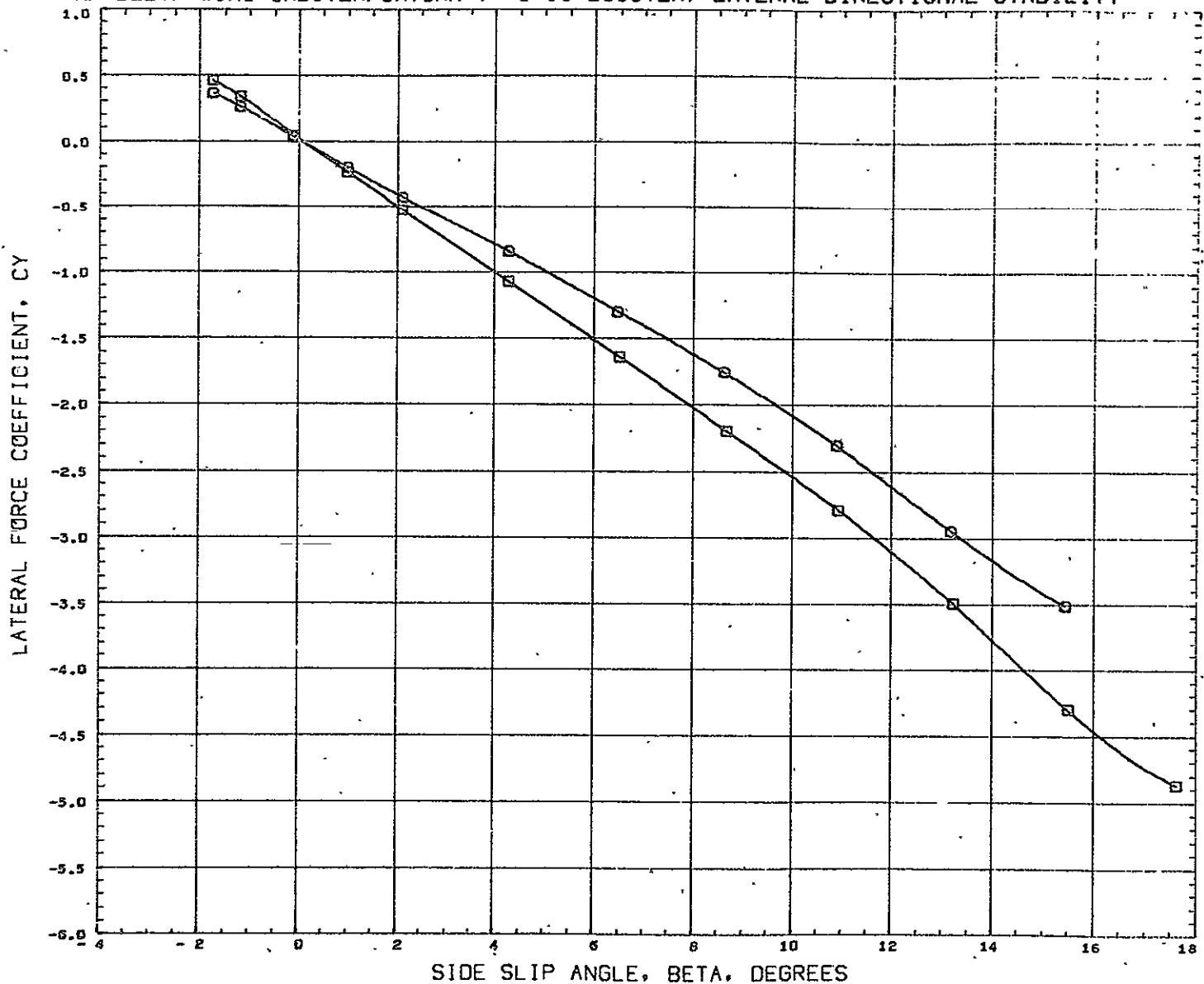
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XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.455

PAGE 139

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

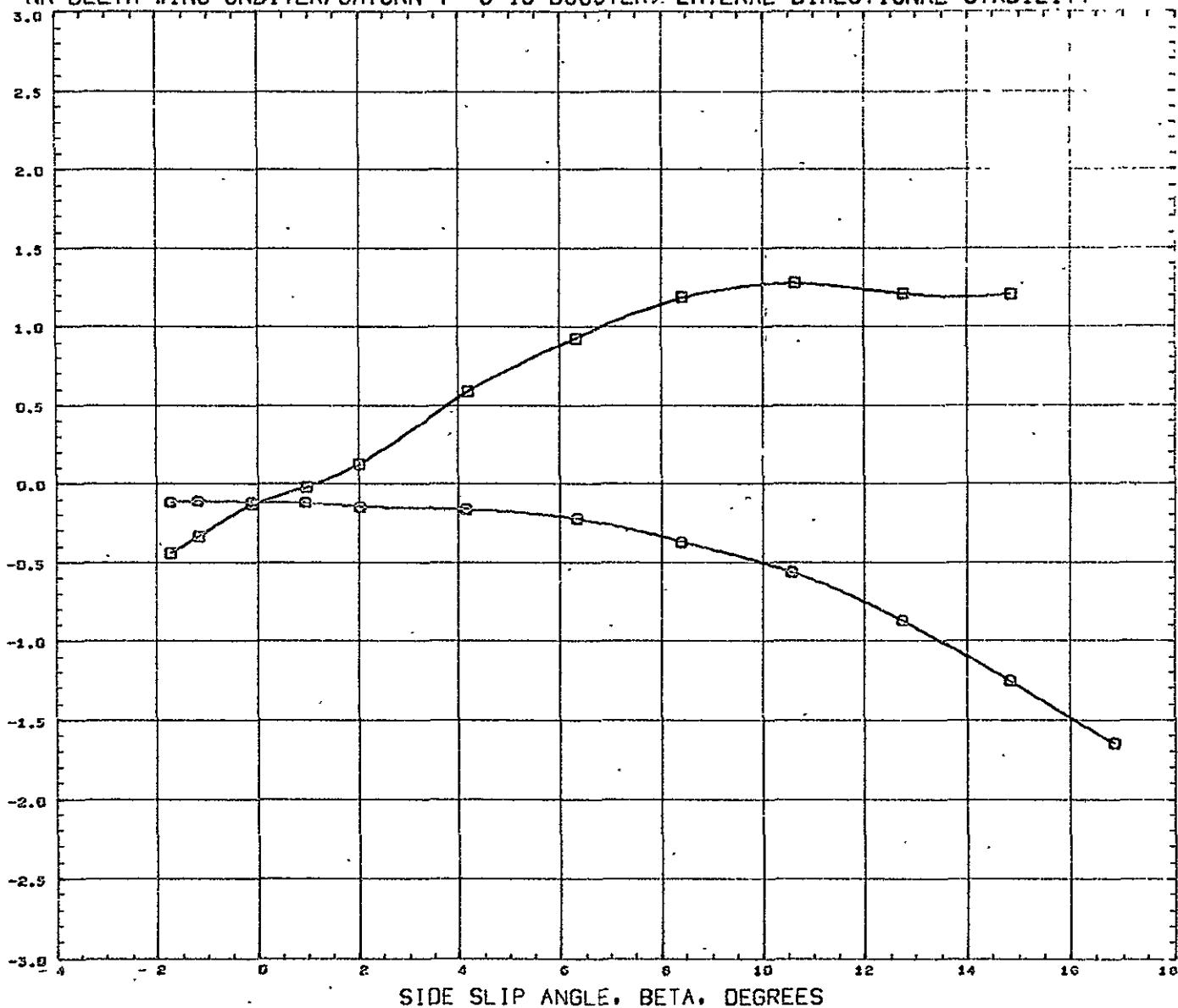
REFERENCE INFORMATION
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REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034 INCHES

MACH 1.959

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

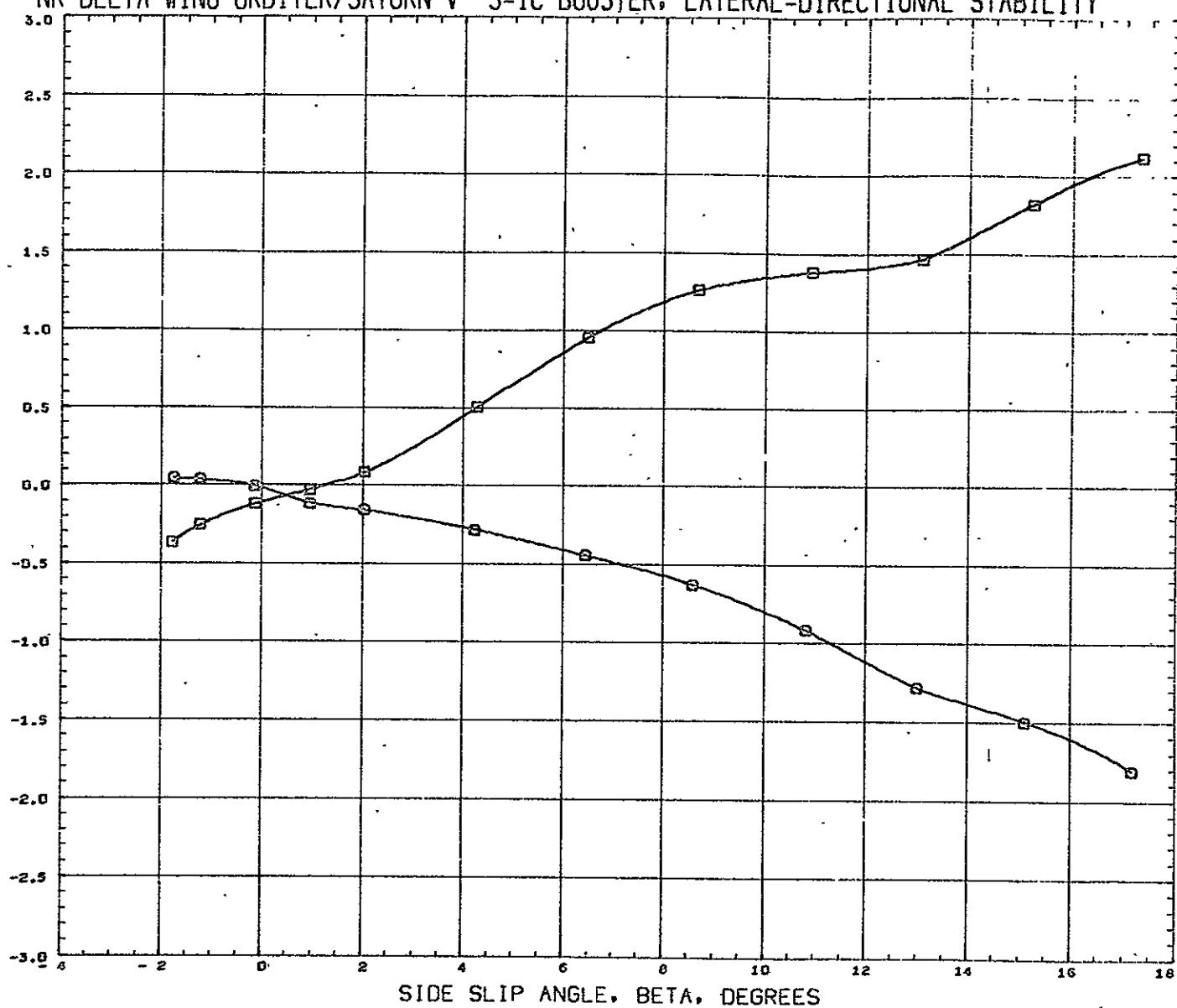
DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
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(R25093)	□ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3Y17		REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XHRF 5.2640 INCHES
			YHRF 0.0000 INCHES
			ZHRF 0.0330 INCHES
			SCALE 0.0034

MACH 0.603

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5H14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

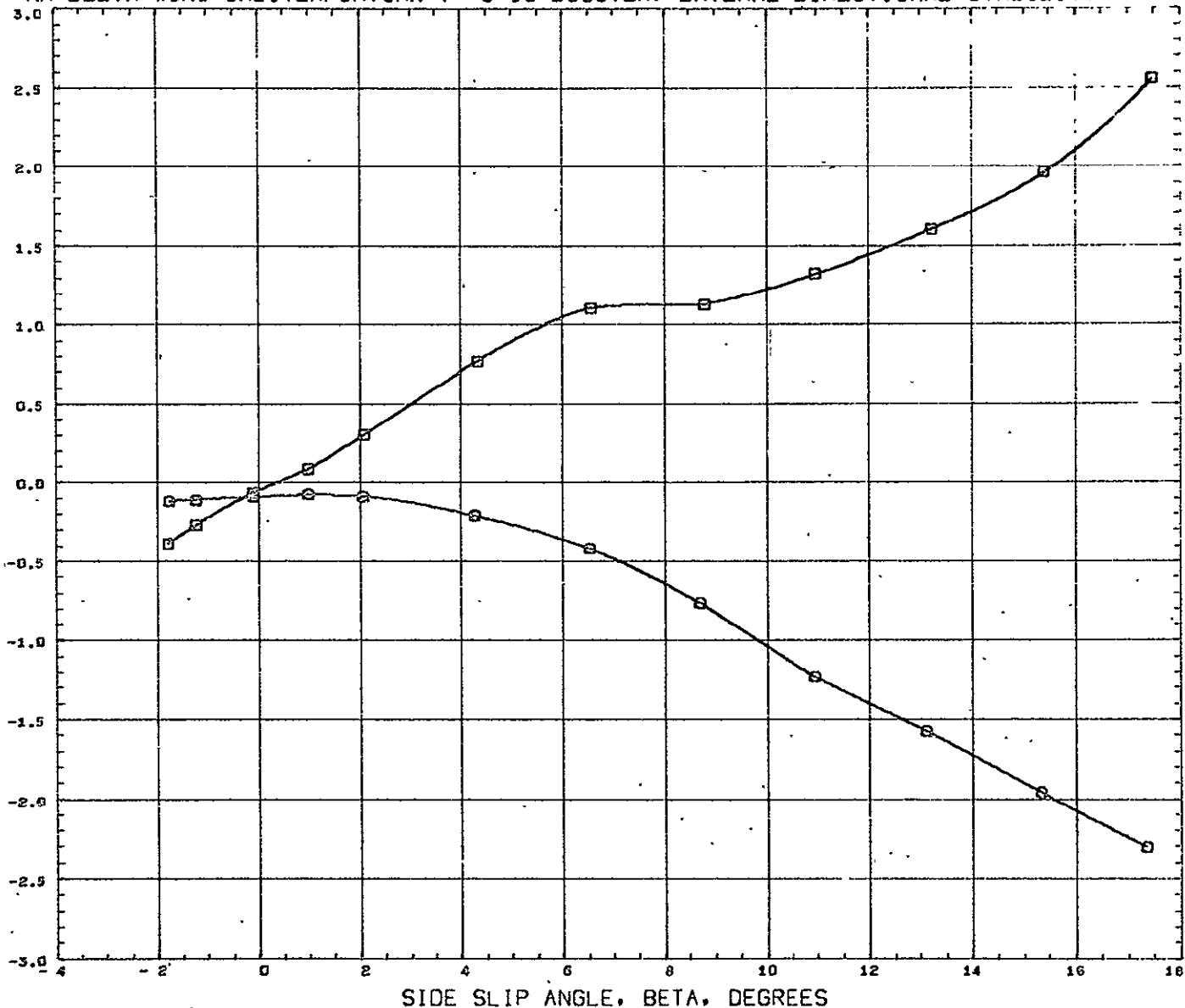
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

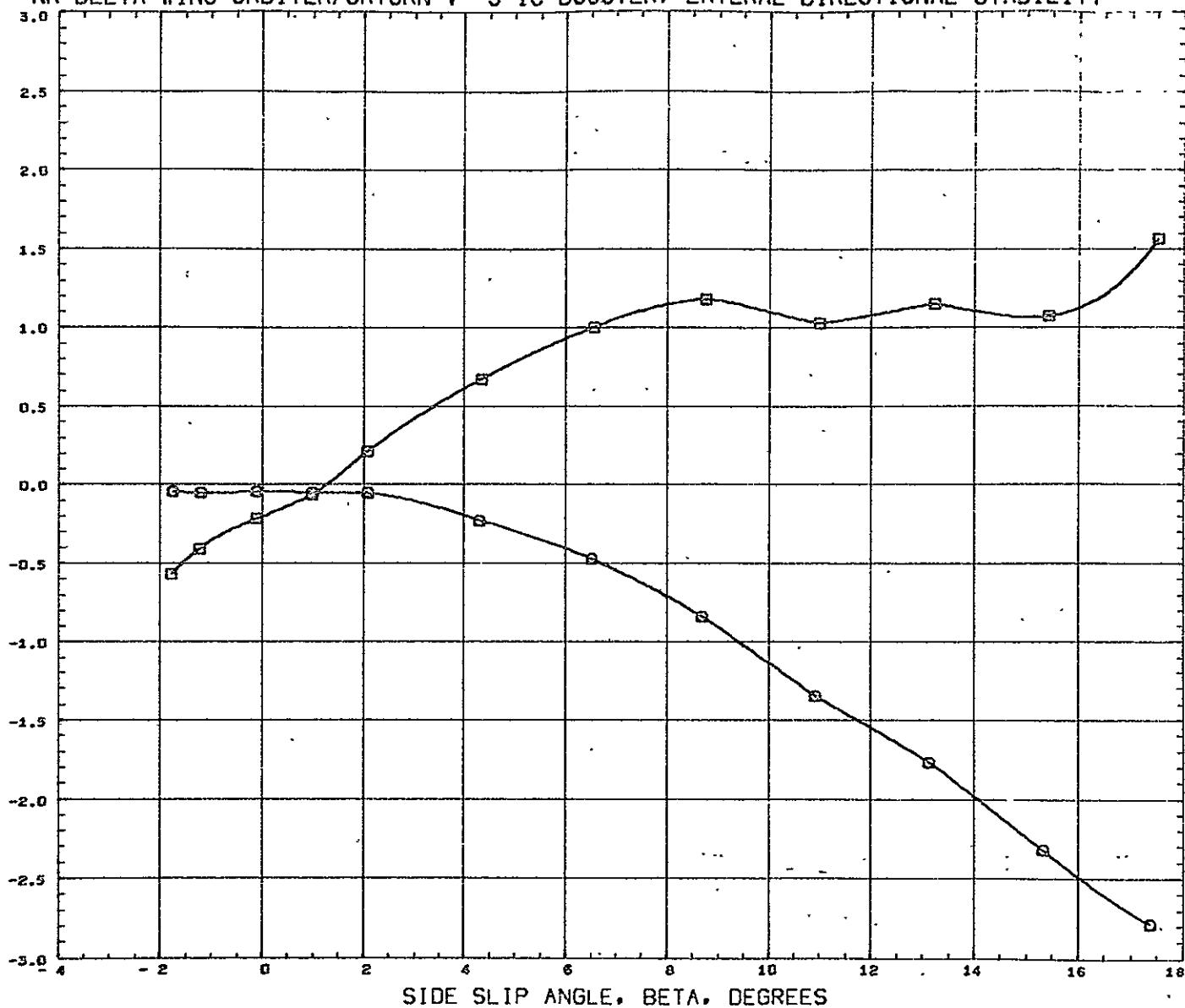
ALPHA = 0.050 ORBINC

REFERENCE INFORMATION
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

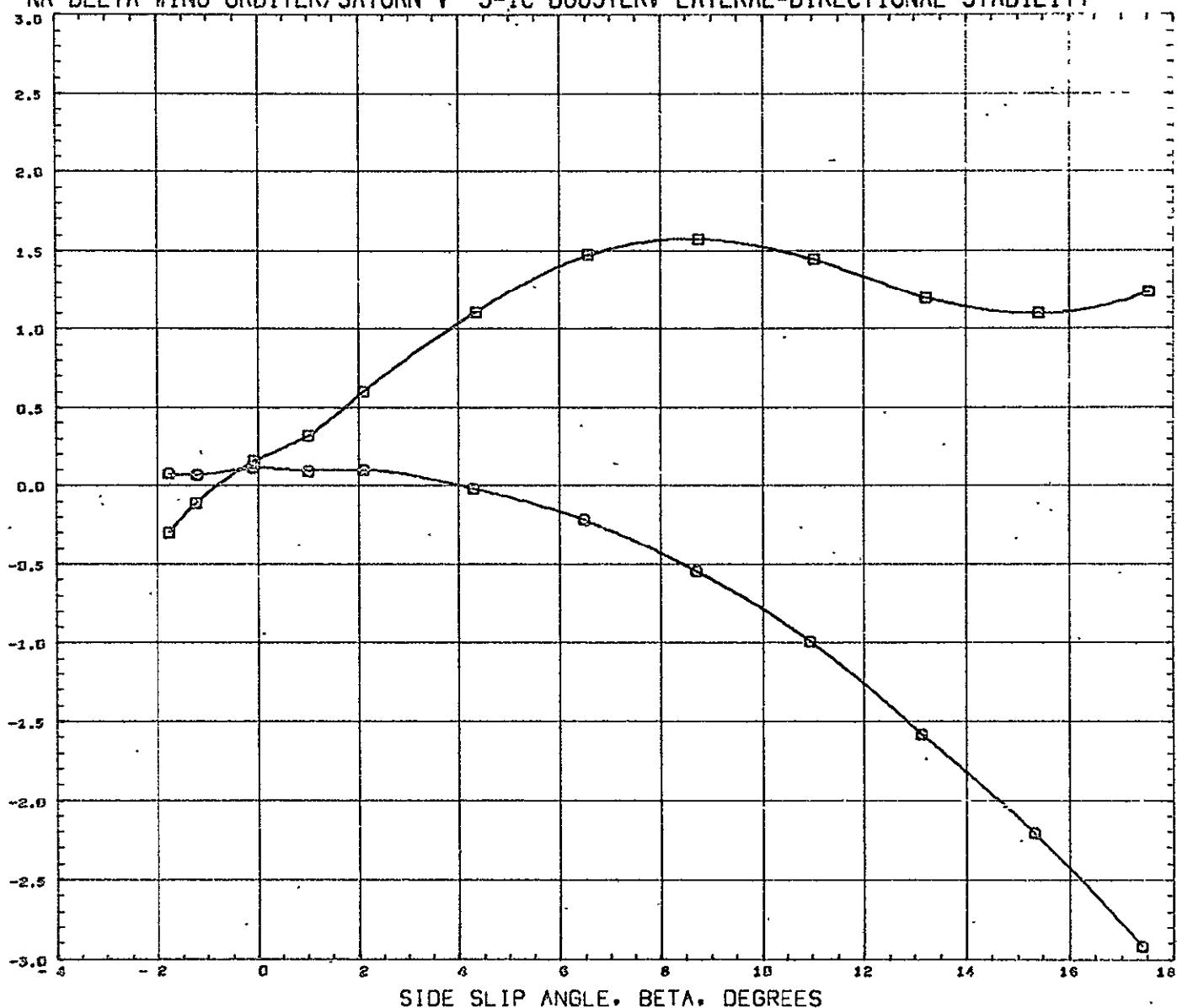
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XHRF	5.2640	INCHES
YNRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ MSFC 476 MR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

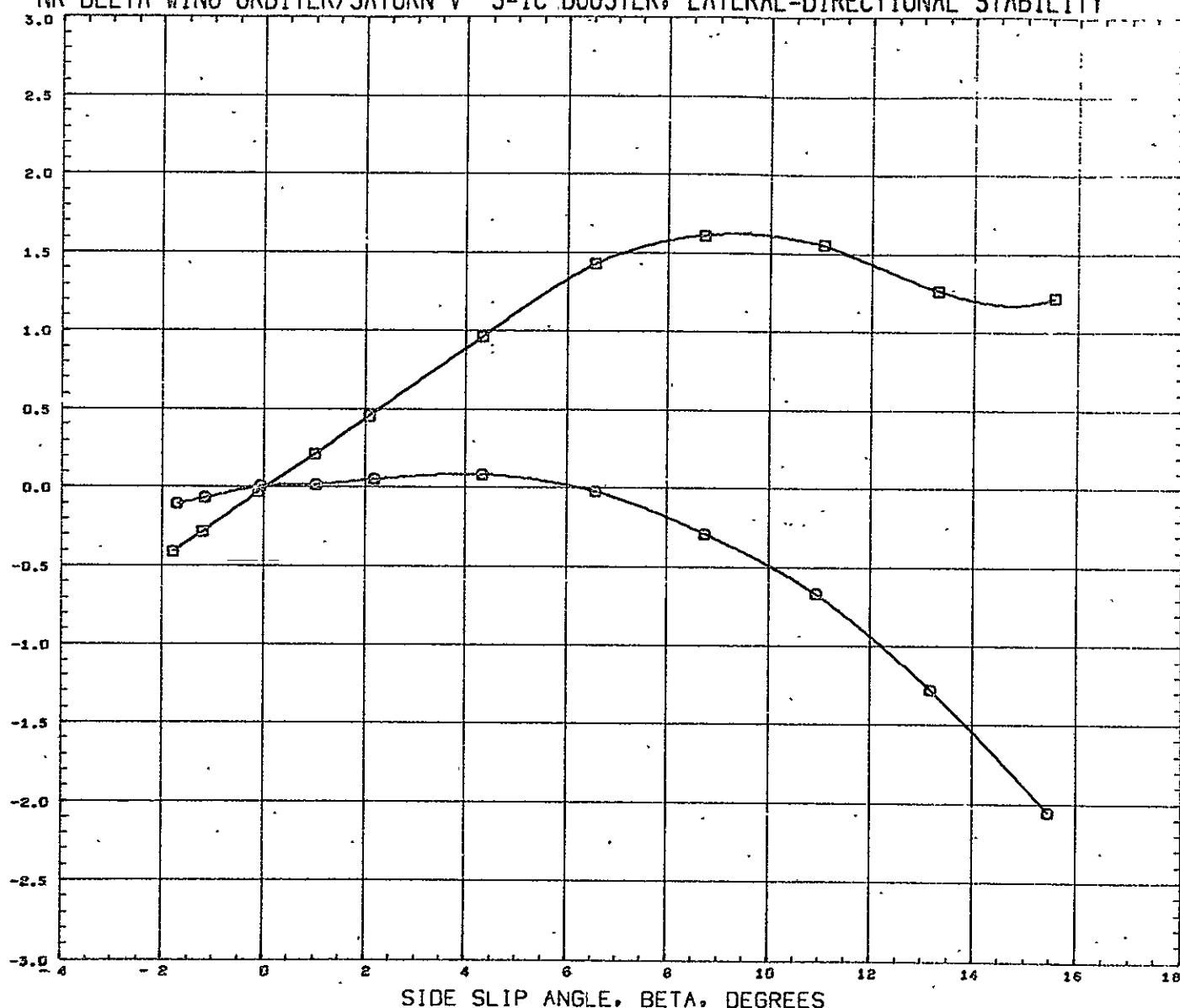
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

HACH 1.196

PAGE 145

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ MSFC 47G NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25093) □ MSFC 47G NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

1.000

REFERENCE INFORMATION

REFS 1.3960 SG.IN.

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REFB 1.3330 INCHES

XNRP 5.2640 INCHES

YNRP 0.0000 INCHES

ZHRF 0.0330 INCHES

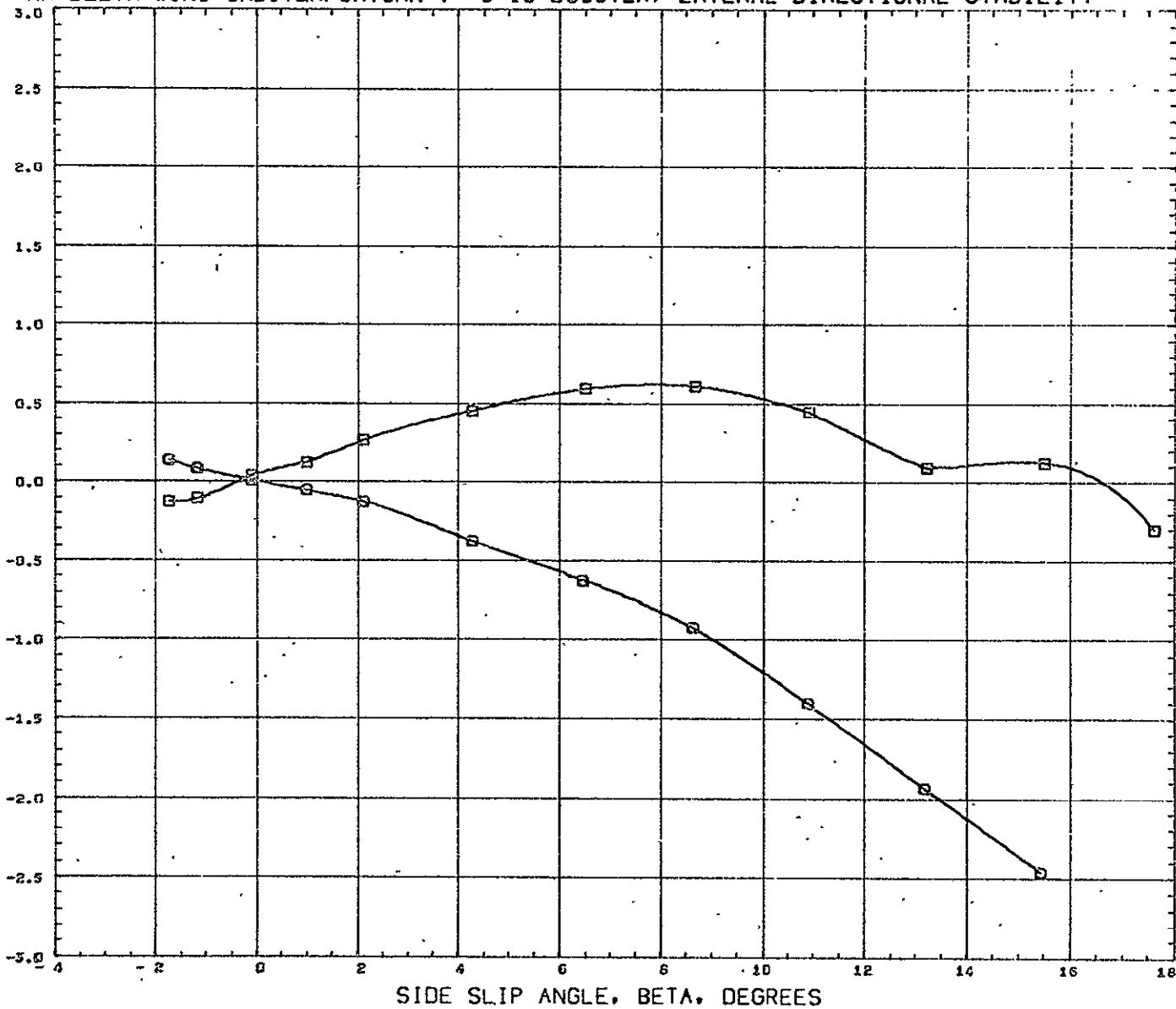
SCALE 0.0034 INCHES

MACH 1.453

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25033) O NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25033) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

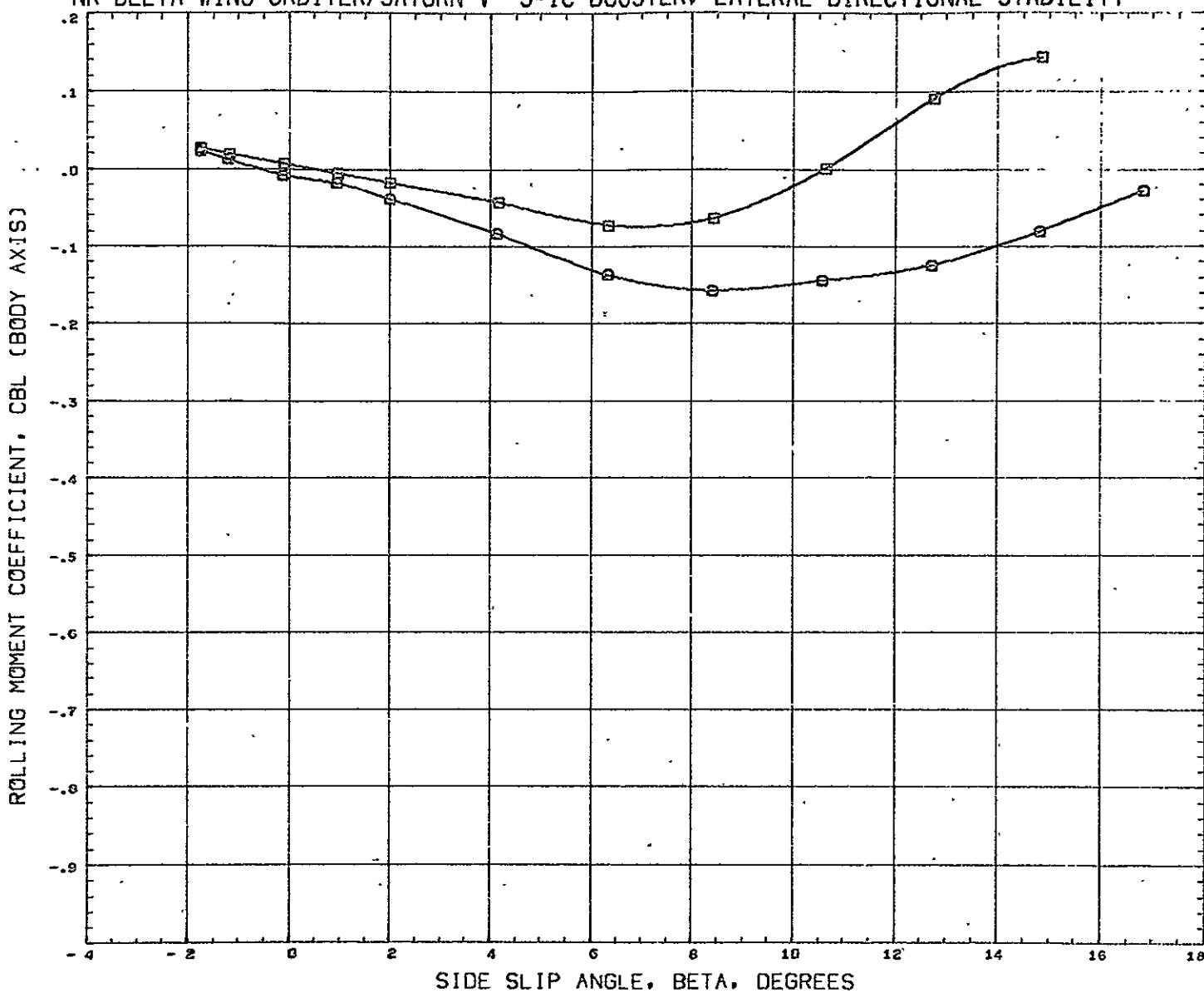
PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

REFERENCE INFORMATION	
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REFL	1.3330 INCHES
REFB	1.3330 INCHES
XHRF	5.2640 INCHES
YNRP	0.0000 INCHES
ZHRP	0.0330 INCHES
SCALE	0.0034

MACH 1.959

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

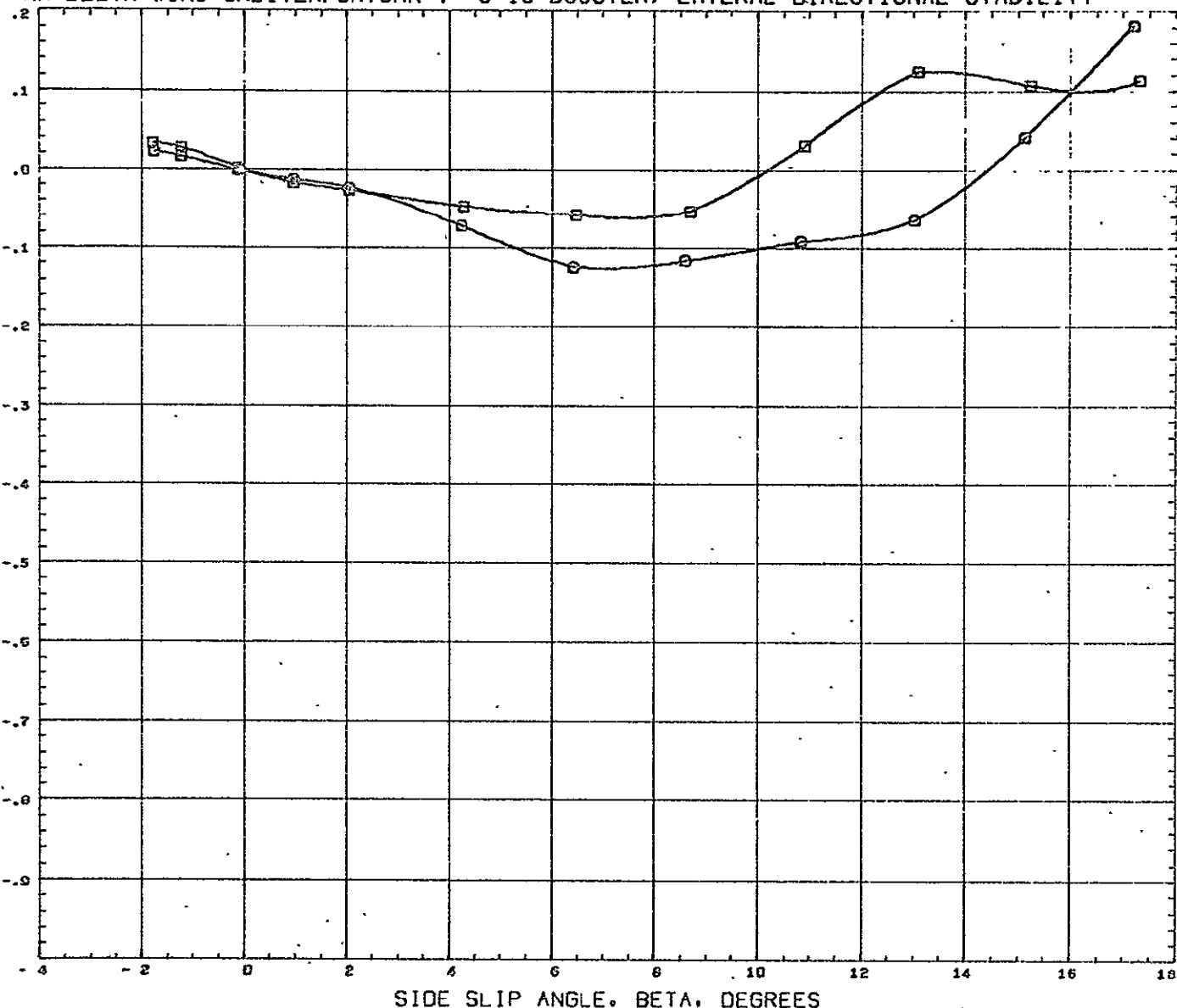
REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
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REFB	1.3330	INCHES
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YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

HACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

ROLLING MOMENT COEFFICIENT, CBL (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

ALPHA -

0.050

ORBINC

1.000

PARAMETRIC VALUES

REFERENCE INFORMATION

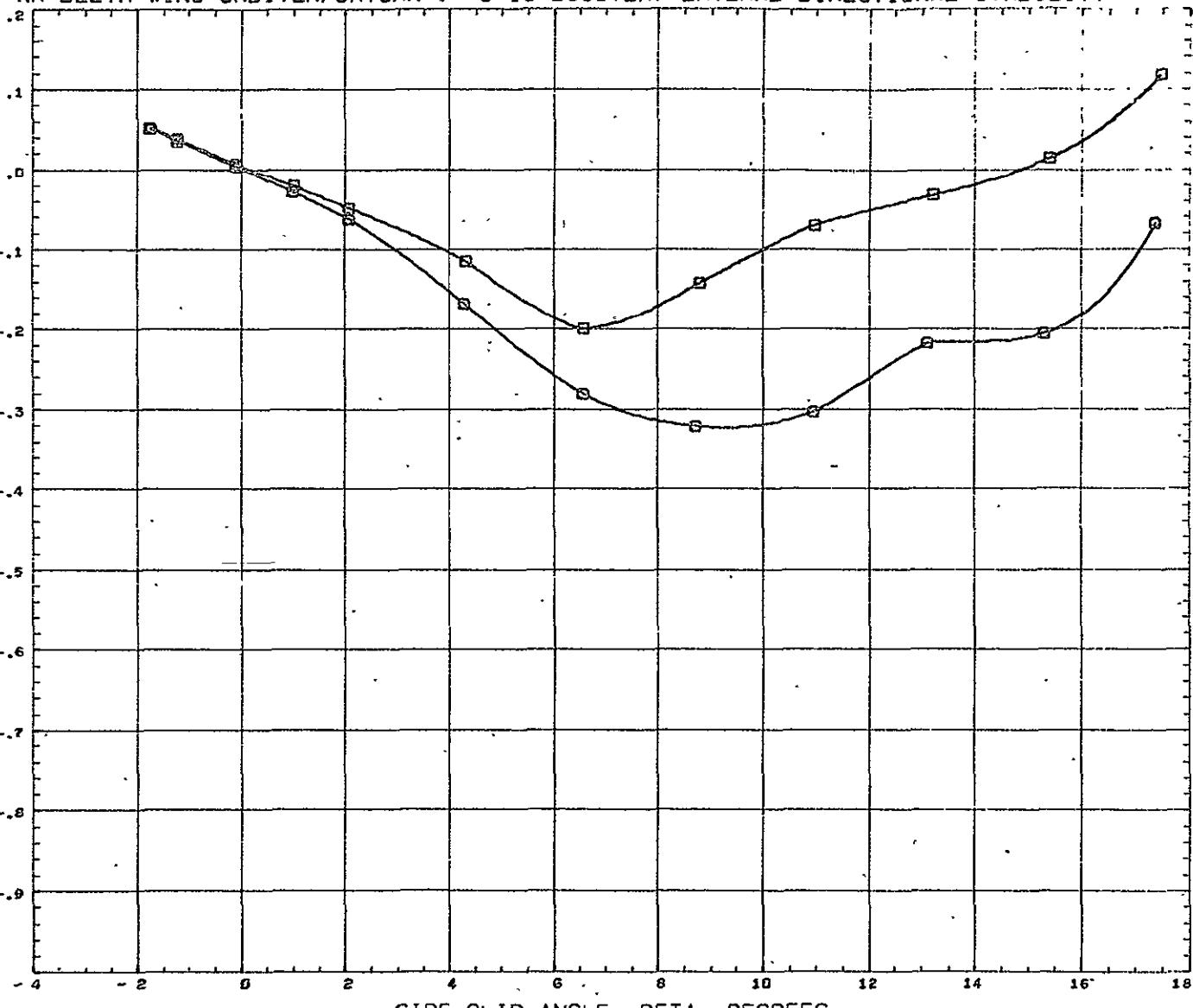
(R23093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

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REFB	1.3330 INCHES
XHRF	5.2640 INCHES
YHRF	0.0000 INCHES
ZHRF	0.0330 INCHES
SCALE	0.0034

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

ROLLING MOMENT COEFFICIENT, CBL (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+BSW14E3V17
 (R25033) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+BSW14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

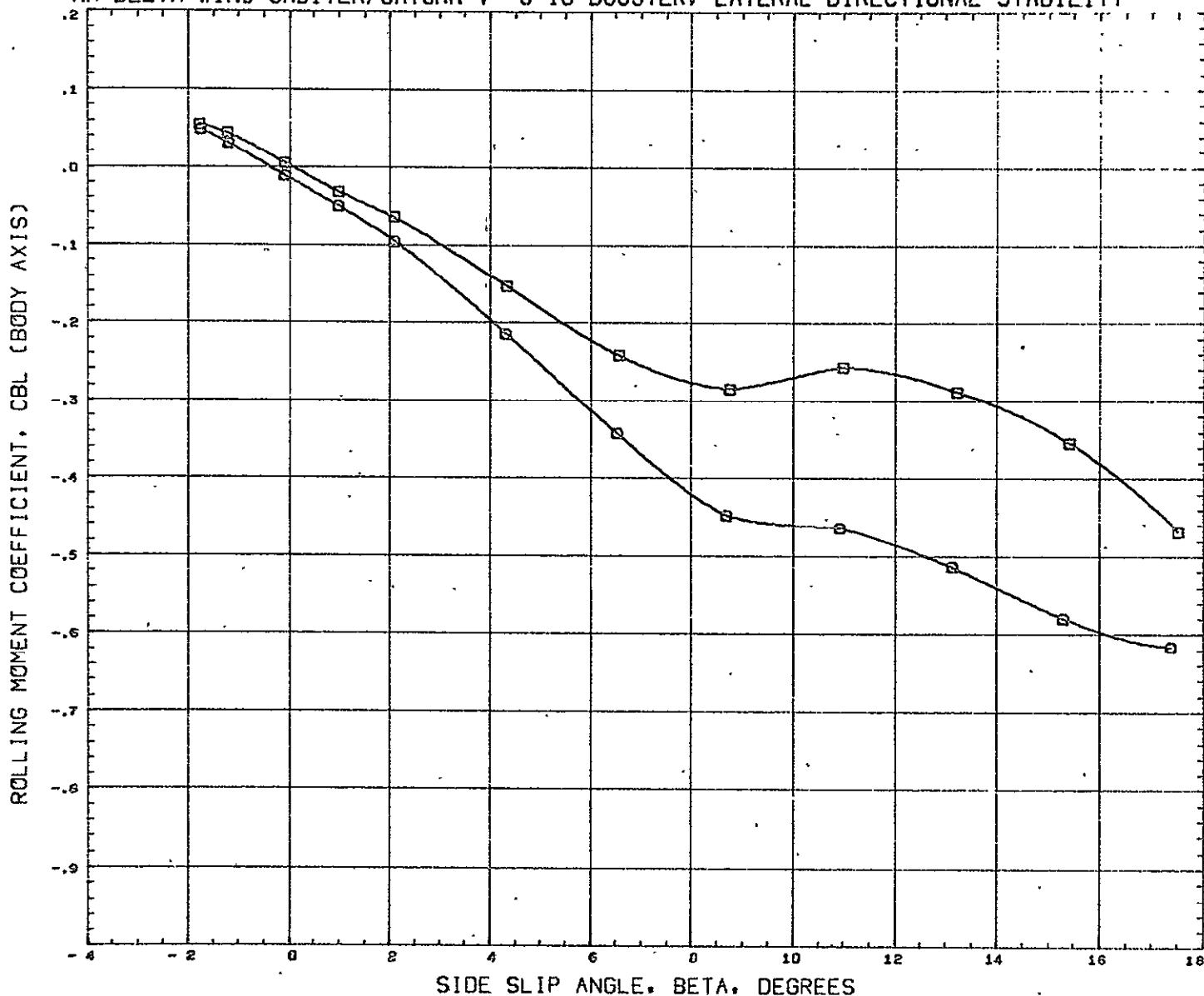
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REFB	1.3330	INCHES
XNRP	5.2640	INCHES
YNRP	0.0000	INCHES
ZNRP	0.0330	INCHES
SCALE	0.0034	INCHES

MACH 0.998

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) \square MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) \square MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

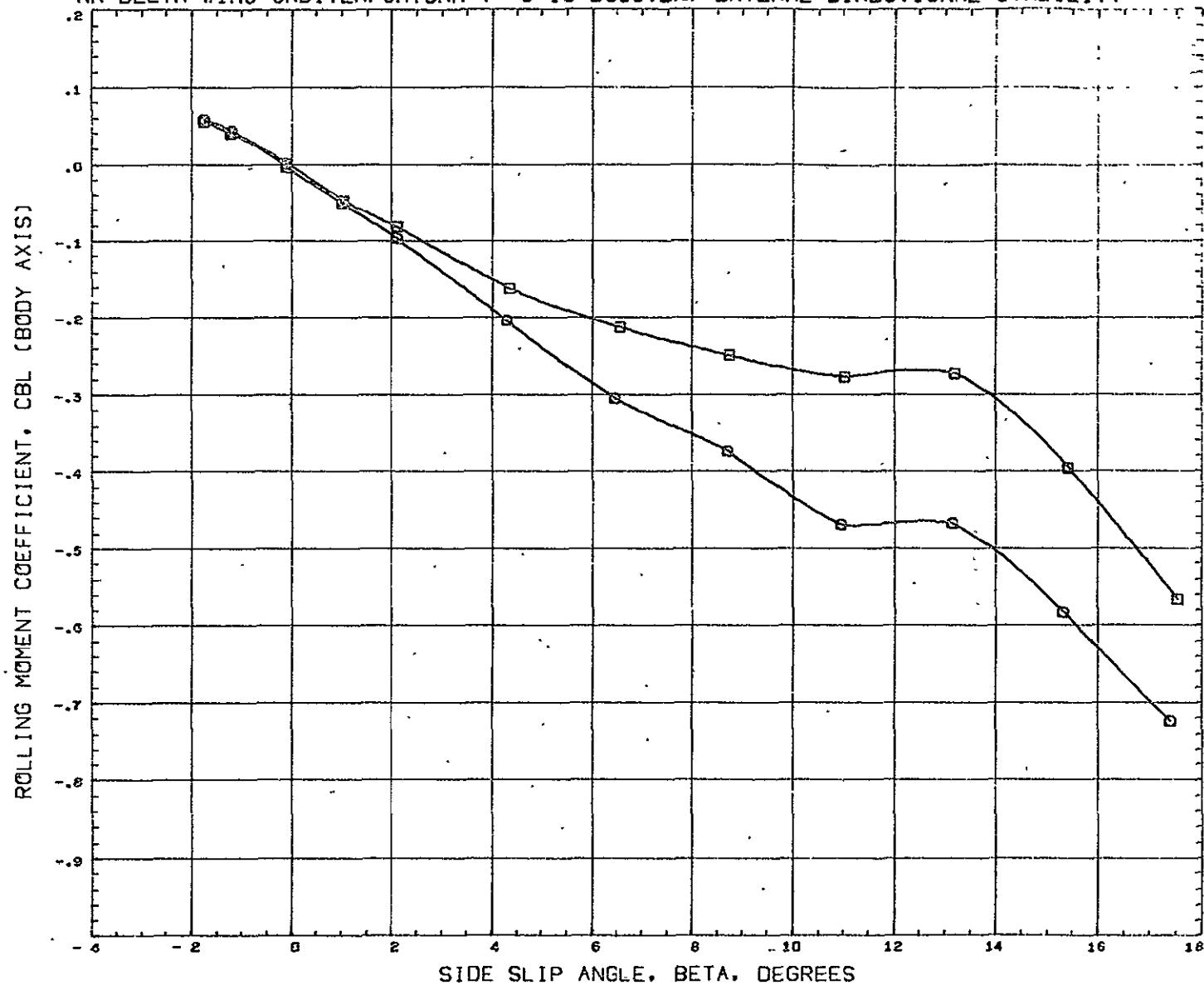
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ALPHA = 0.050 ORBINC

REFERENCE INFORMATION		
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) \circ NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

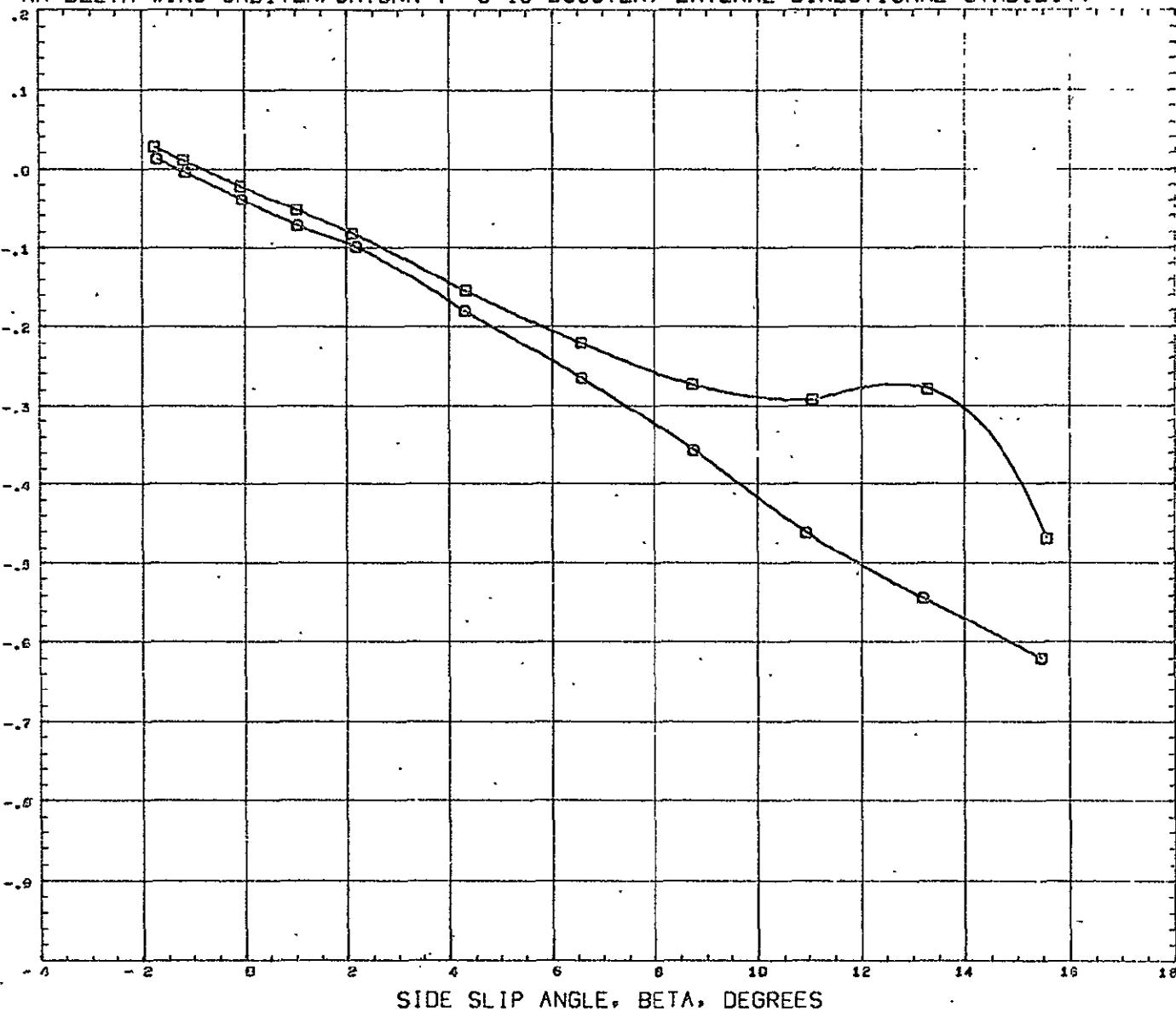
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

ROLLING MOMENT COEFFICIENT, CBL (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O HSFC 475 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

1.000

REFERENCE INFORMATION

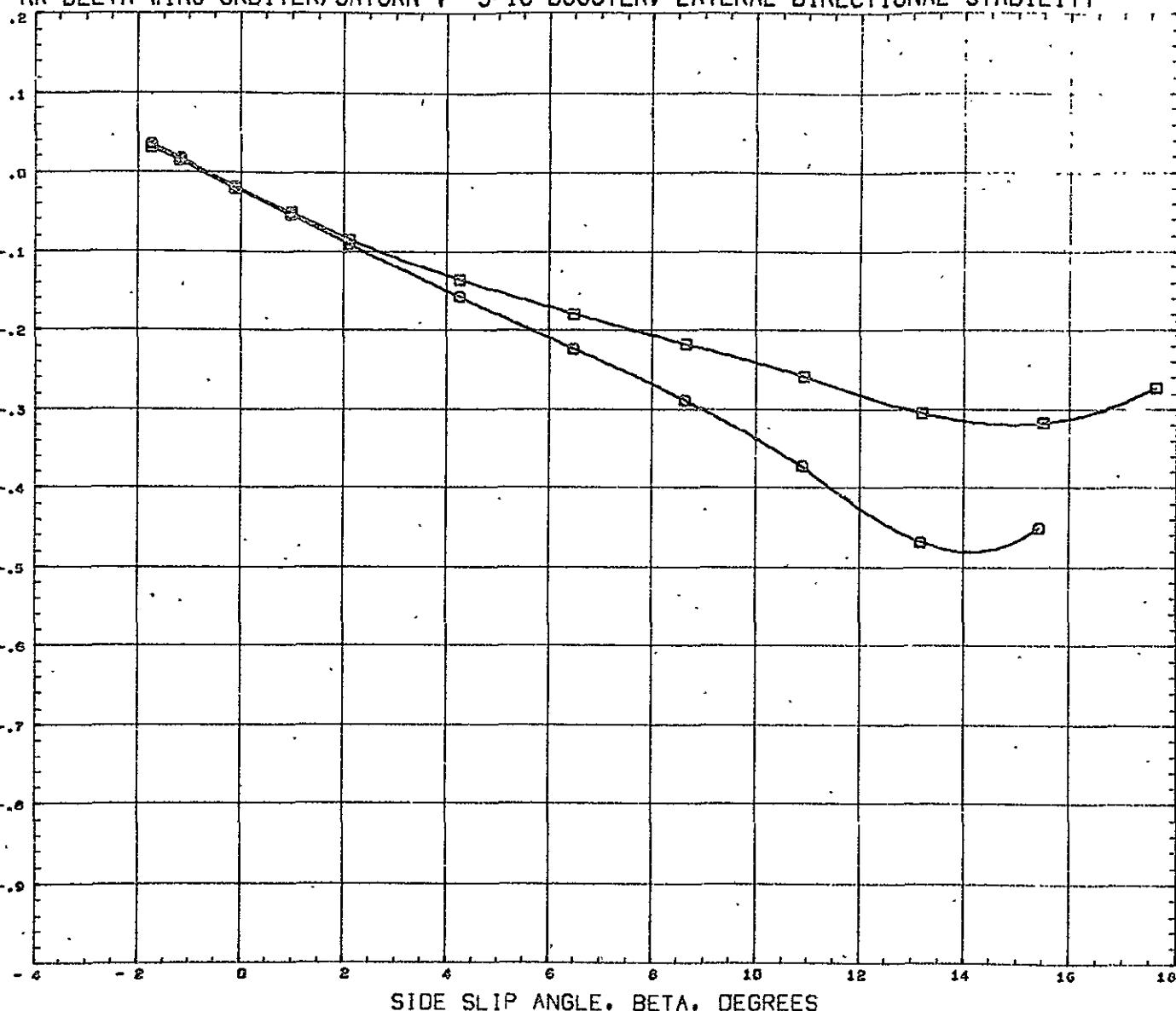
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REFB	1.3330	INCHES
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YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.455

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

ROLLING MOMENT COEFFICIENT, CBL (BODY AXIS)



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

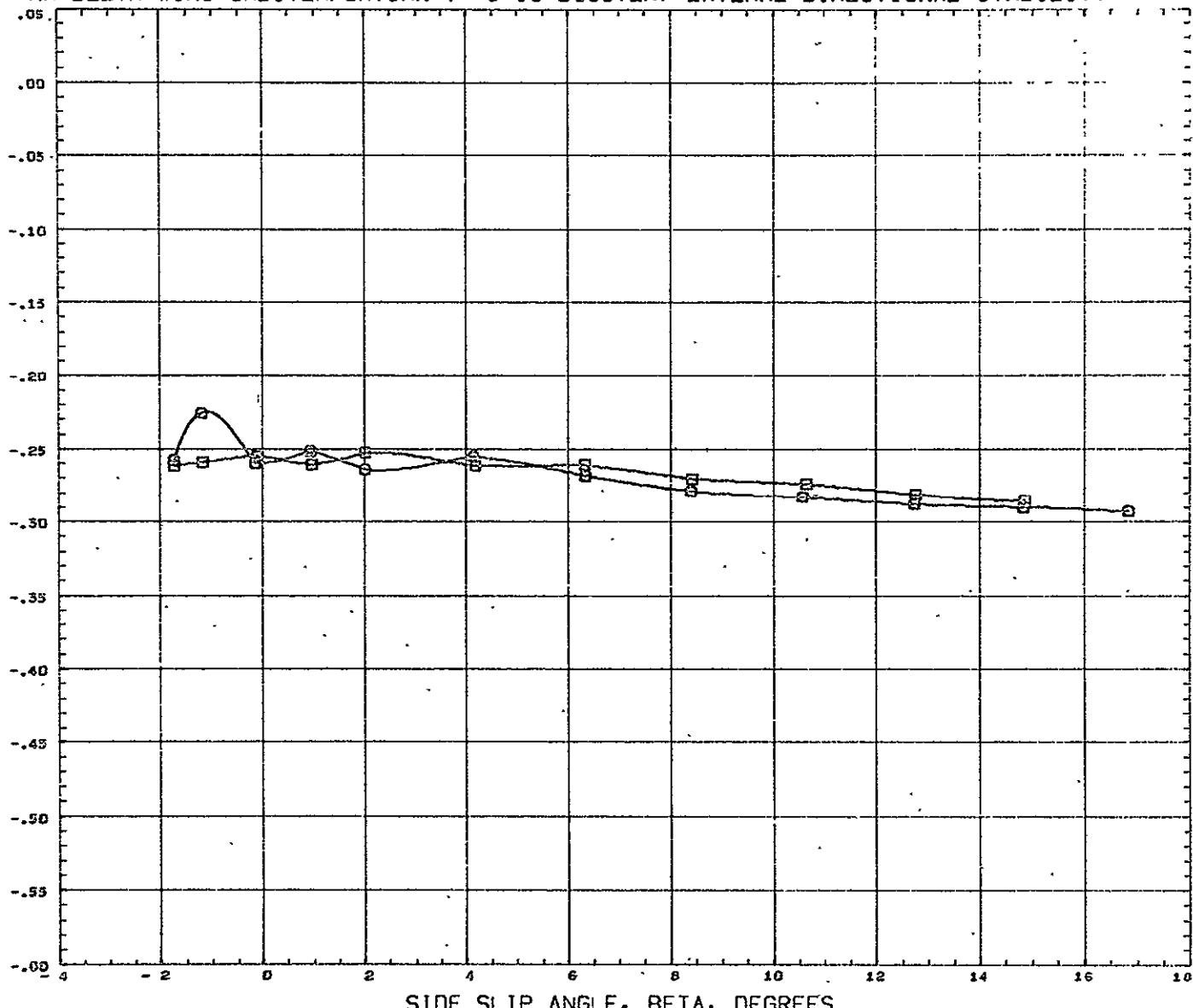
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.959

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB1



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

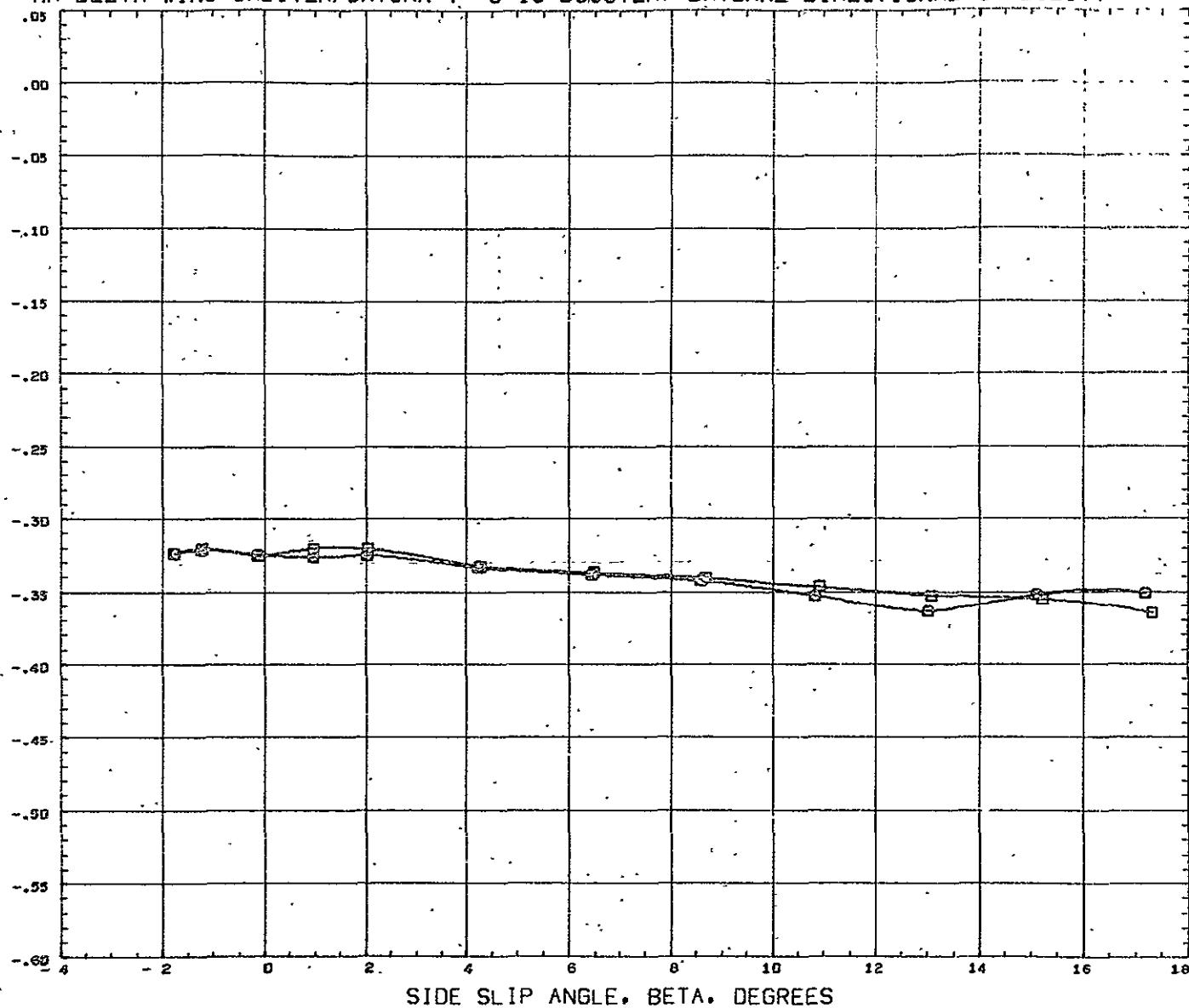
ALPHA = 0.050 ORBINC

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XNRP 5.2640 INCHES
YNRF 0.0000 INCHES
ZNRP 0.0330 INCHES
SCALE 0.0034

HACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB1



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O HSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25093) □ HSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

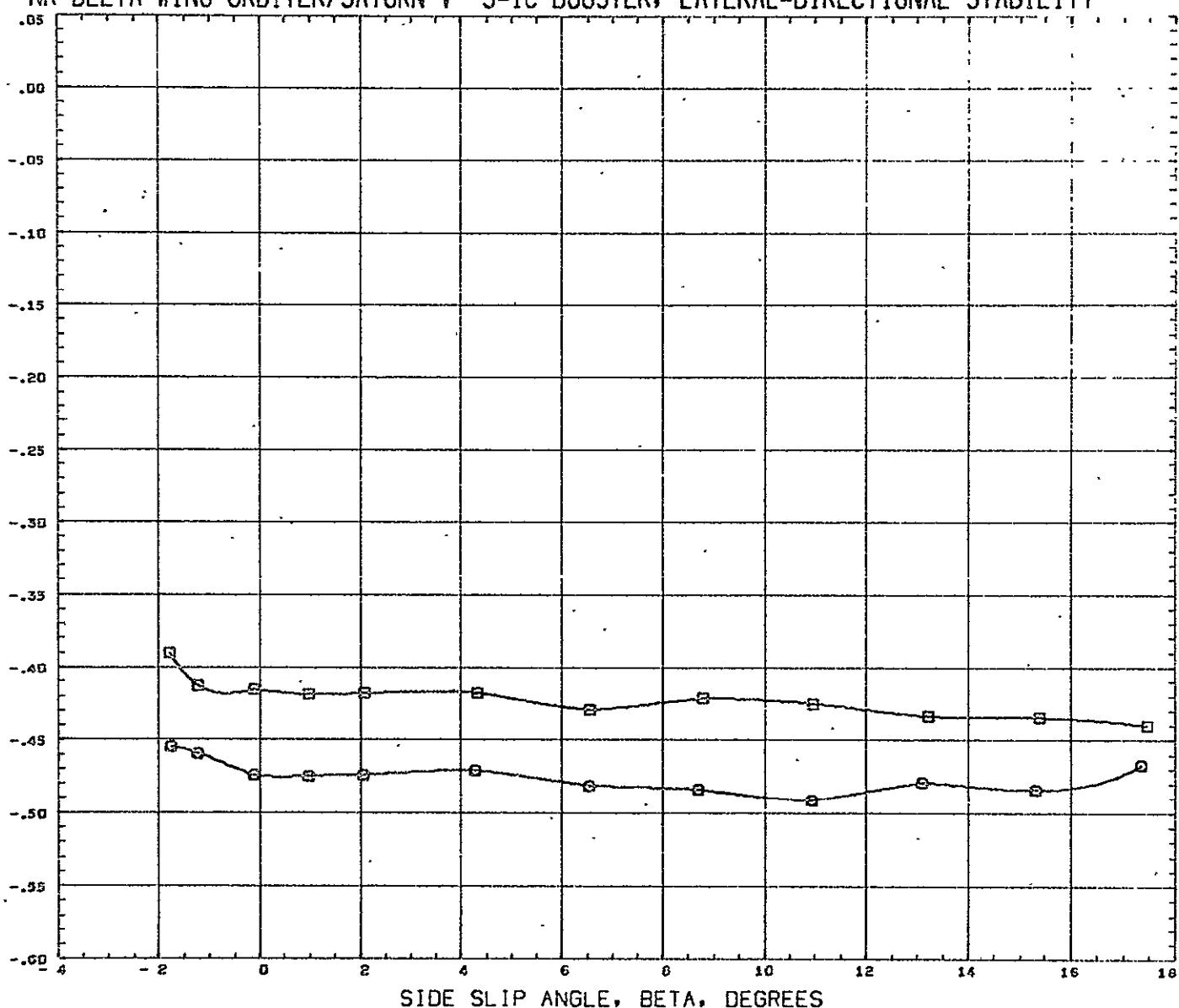
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.899

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB1



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25093) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

1.000

REFERENCE INFORMATION

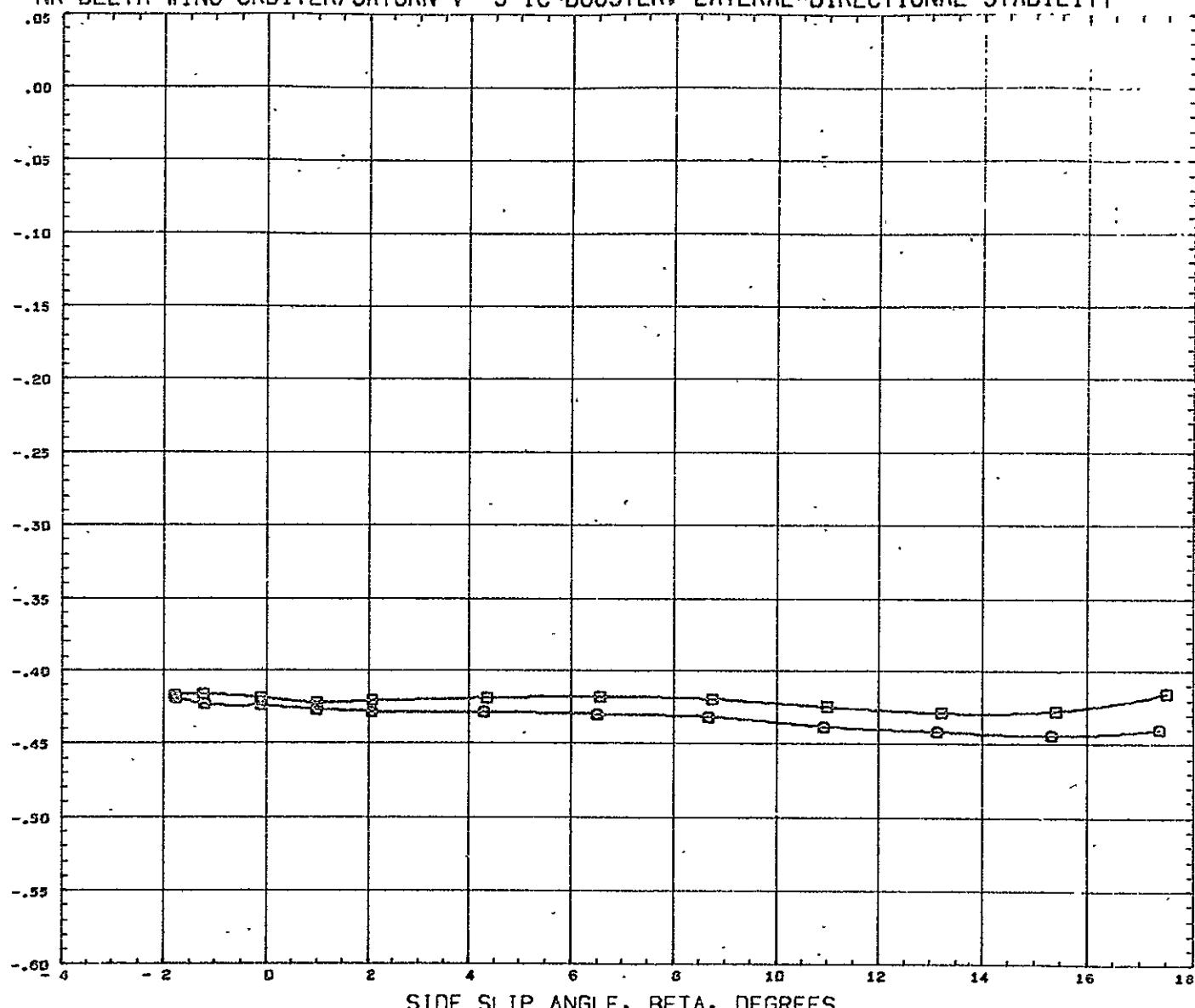
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	INCHES

MACH 0.998

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB1



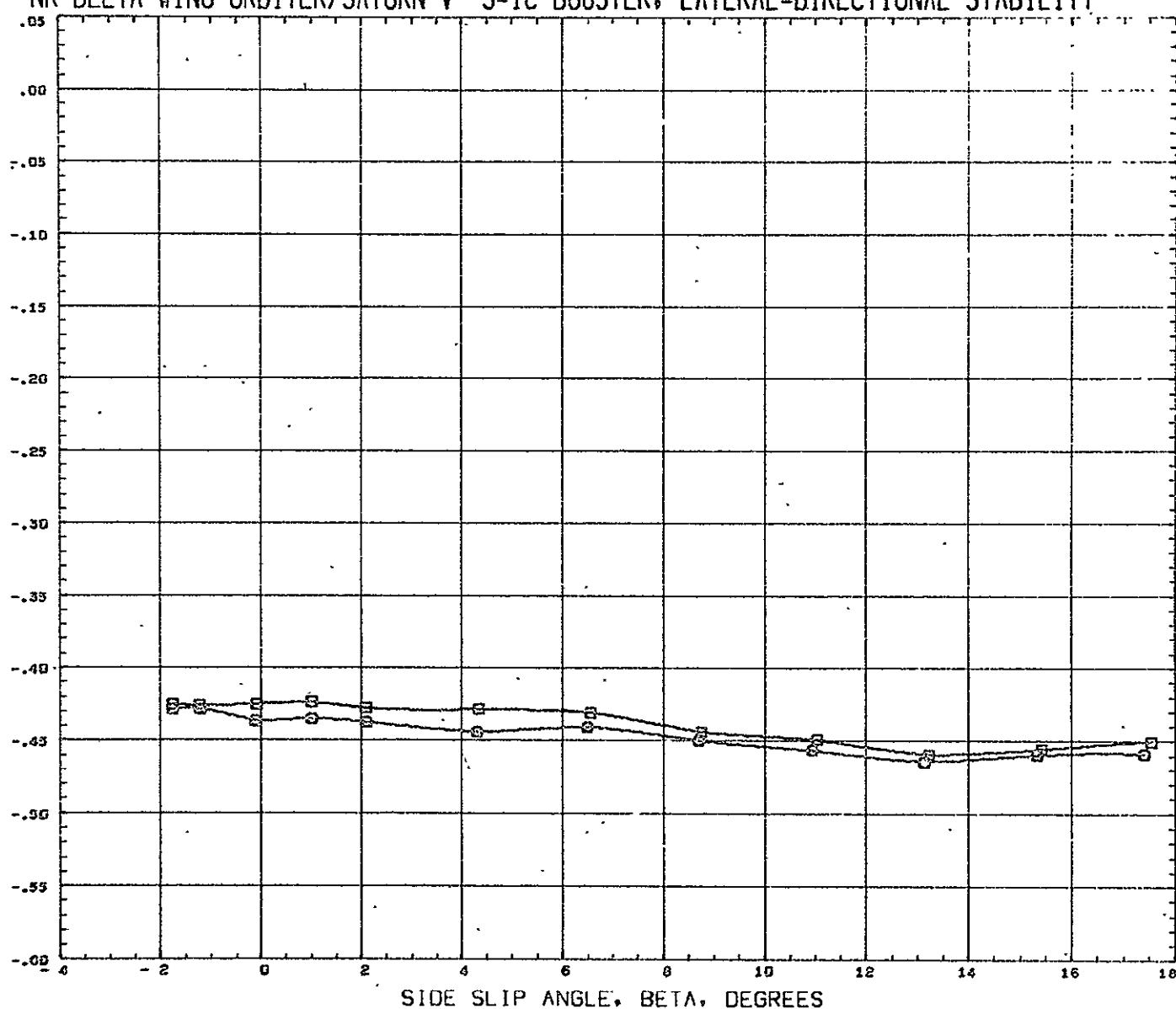
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(R25093)	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17	ORBINC 1.000	REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XNRP 5.2640 INCHES
			YNRP 0.0000 INCHES
			ZHRP 0.0330 INCHES
			SCALE 0.0034

MACH 1.097

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB1



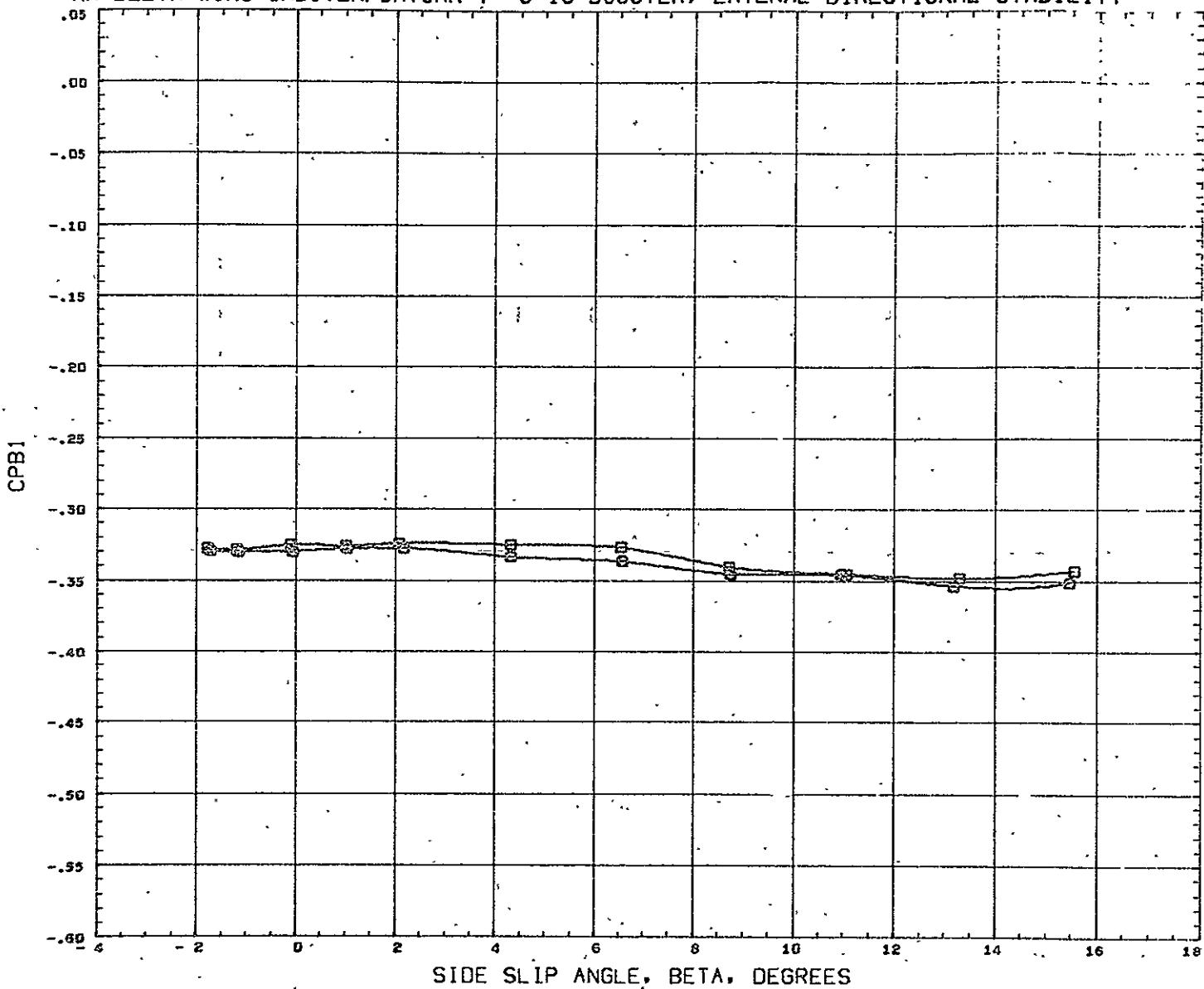
SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
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(R25093) □	HSFC 476 NR HCROR/S-ICBOOSTER BF2S+B5W14E3V17	REFL 1.3330 INCHES	
		REFB 1.3330 INCHES	
		XHRC 5.2640 INCHES	
		YHRC 0.0000 INCHES	
		ZHRC 0.0330 INCHES	
		SCALE 0.0034	

MACH 1.196

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
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PARAMETRIC VALUES

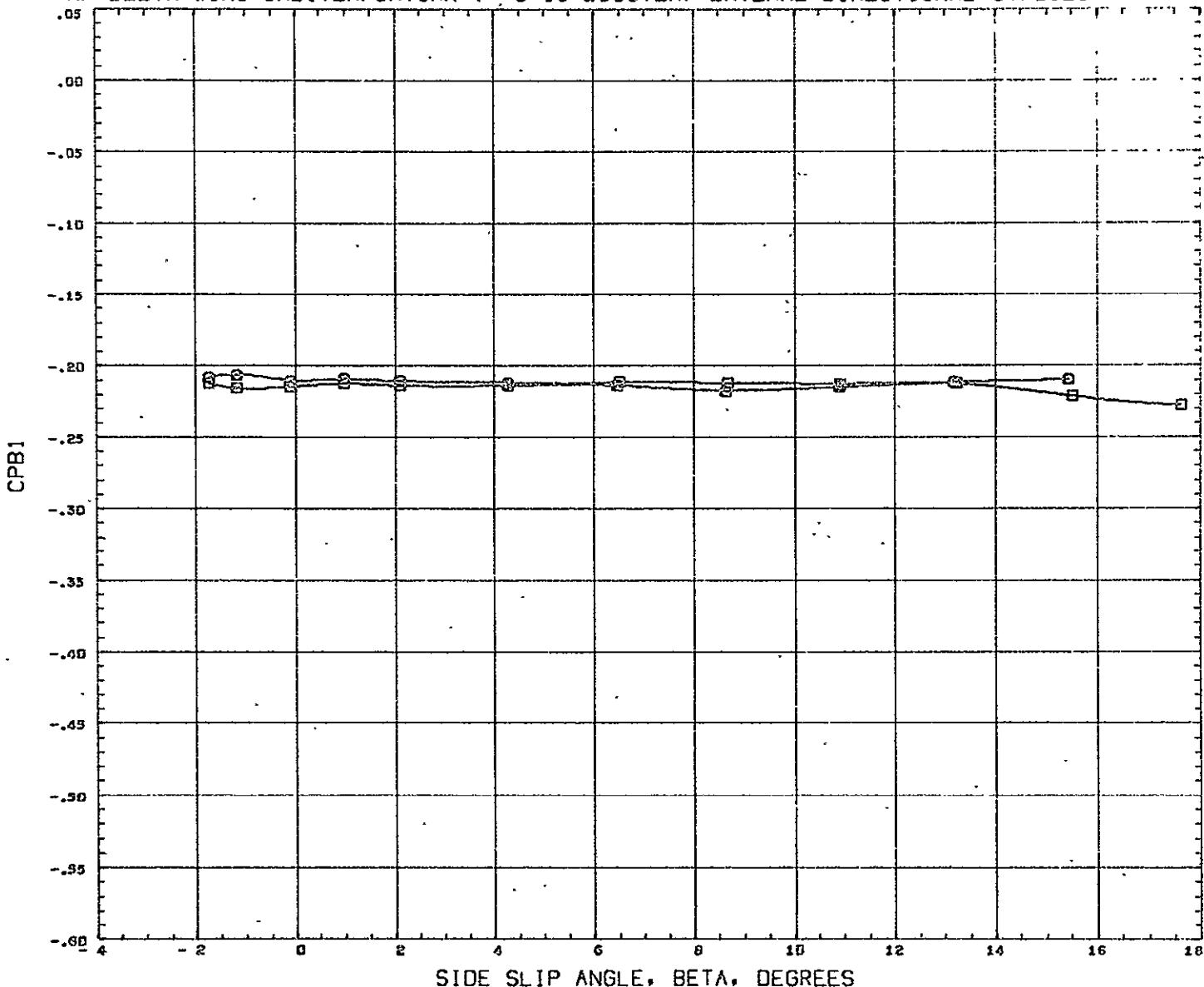
ALPHA = 0.050 ORBINC = 1.000

REFERENCE INFORMATION
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 ZHRP = 0.0330 INCHES
 SCALE = 0.0034

MACH = 1.455

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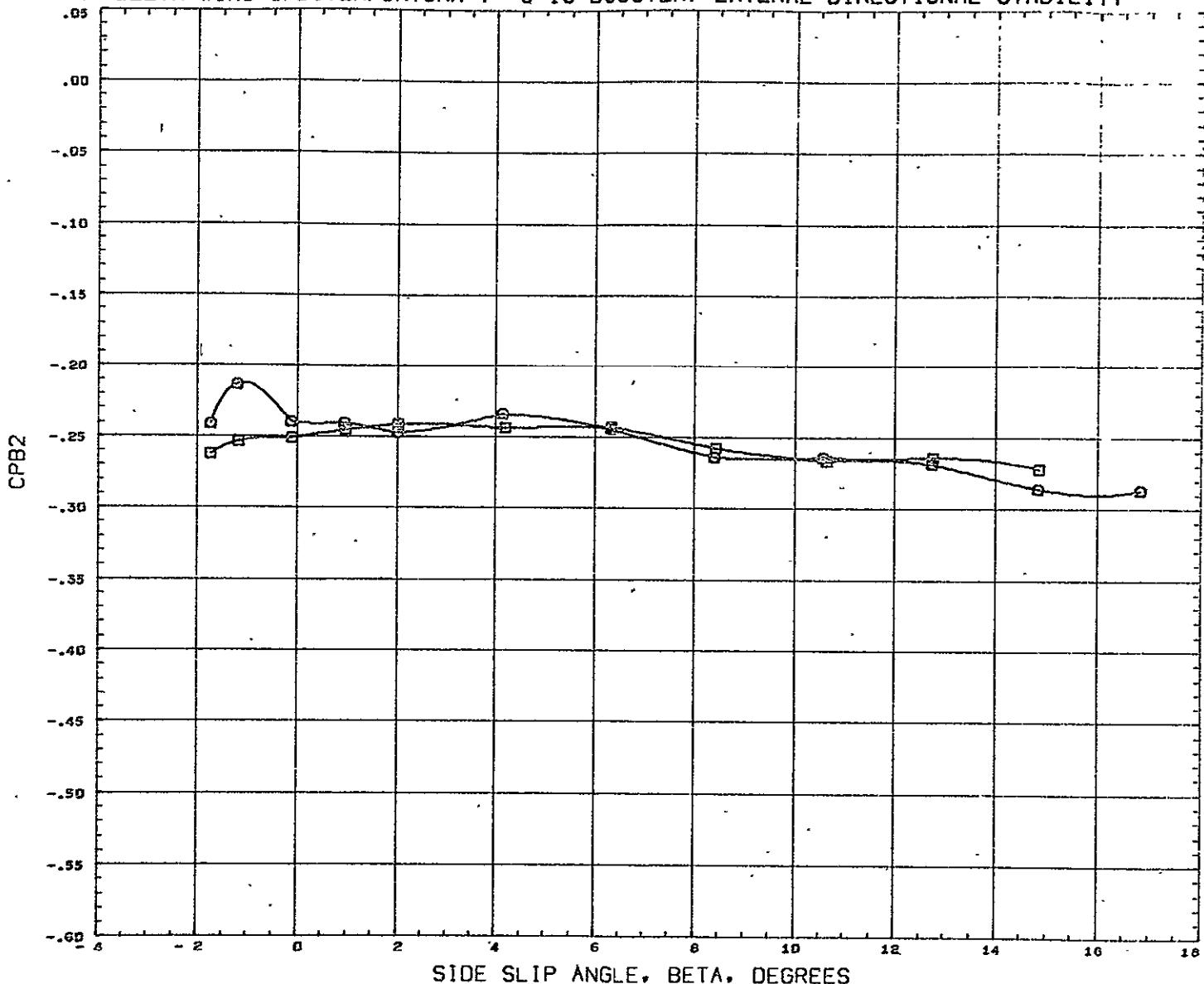
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
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(R25093)	□ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17		REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XHRF 5.2640 INCHES
			YHRF 0.0000 INCHES
			ZHRF 0.0330 INCHES
			SCALE 0.0034

MACH 1.959

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

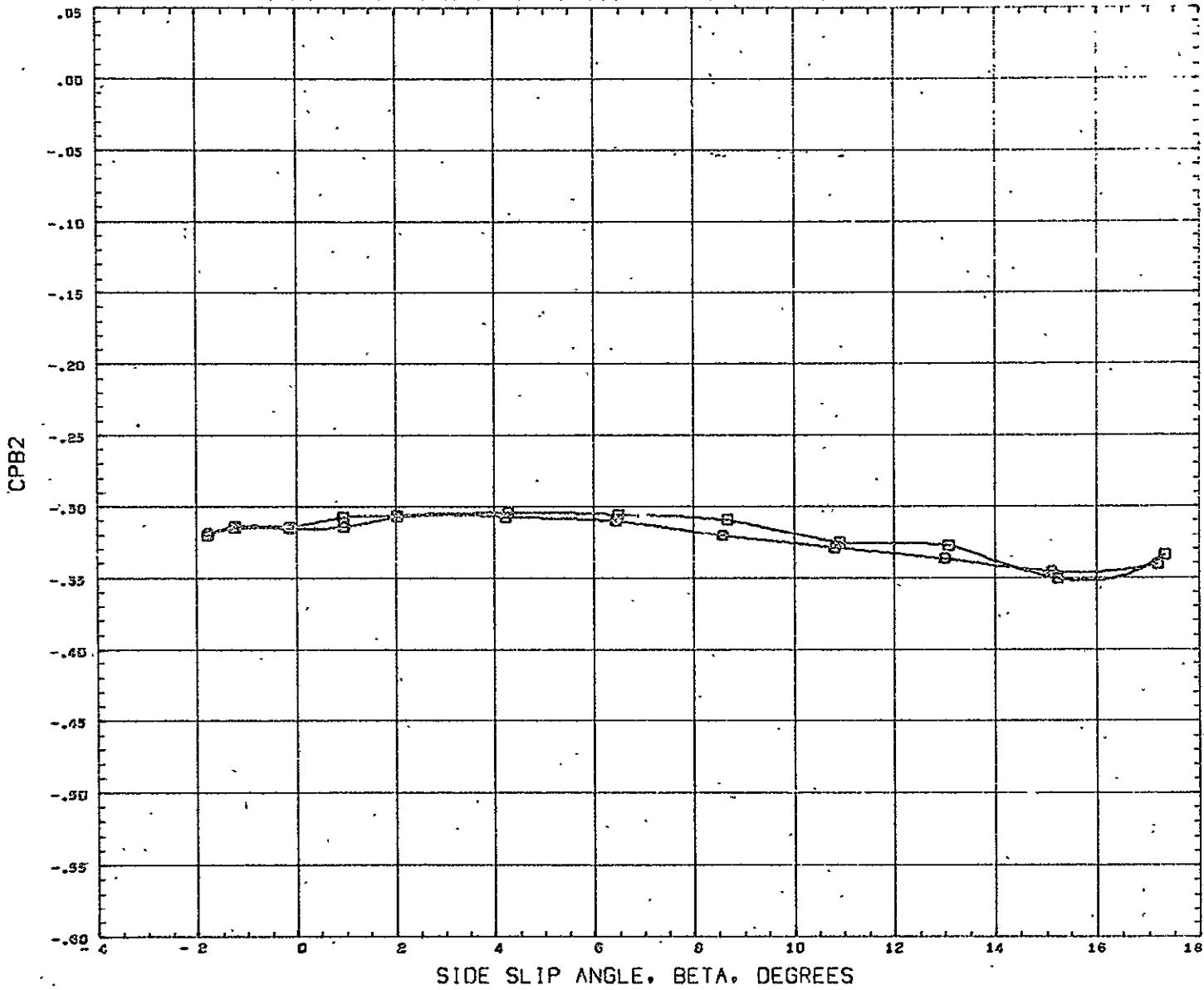
PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION
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REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034

MACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) MSFC 47G NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) MSFC 47G NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

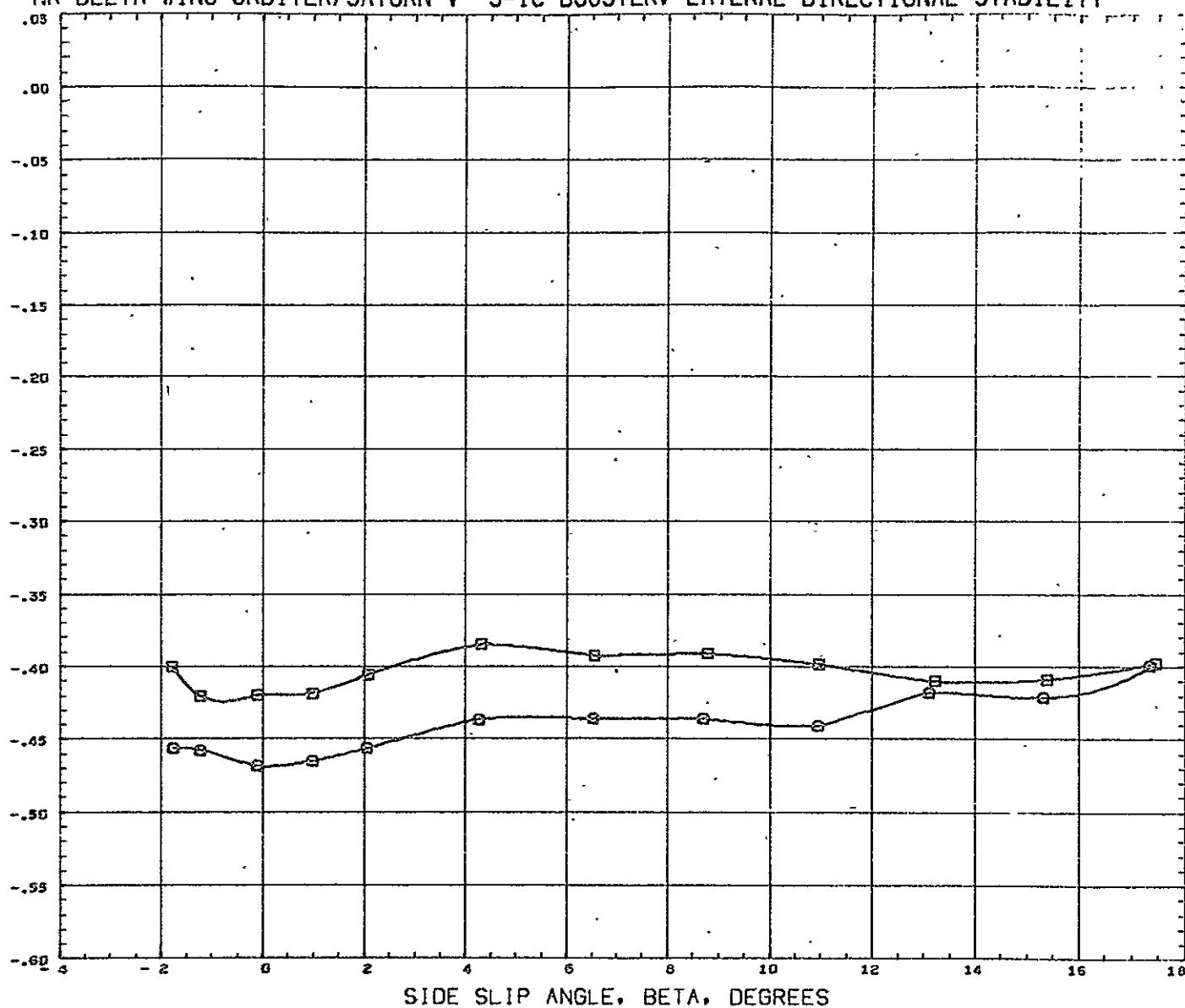
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REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB2



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

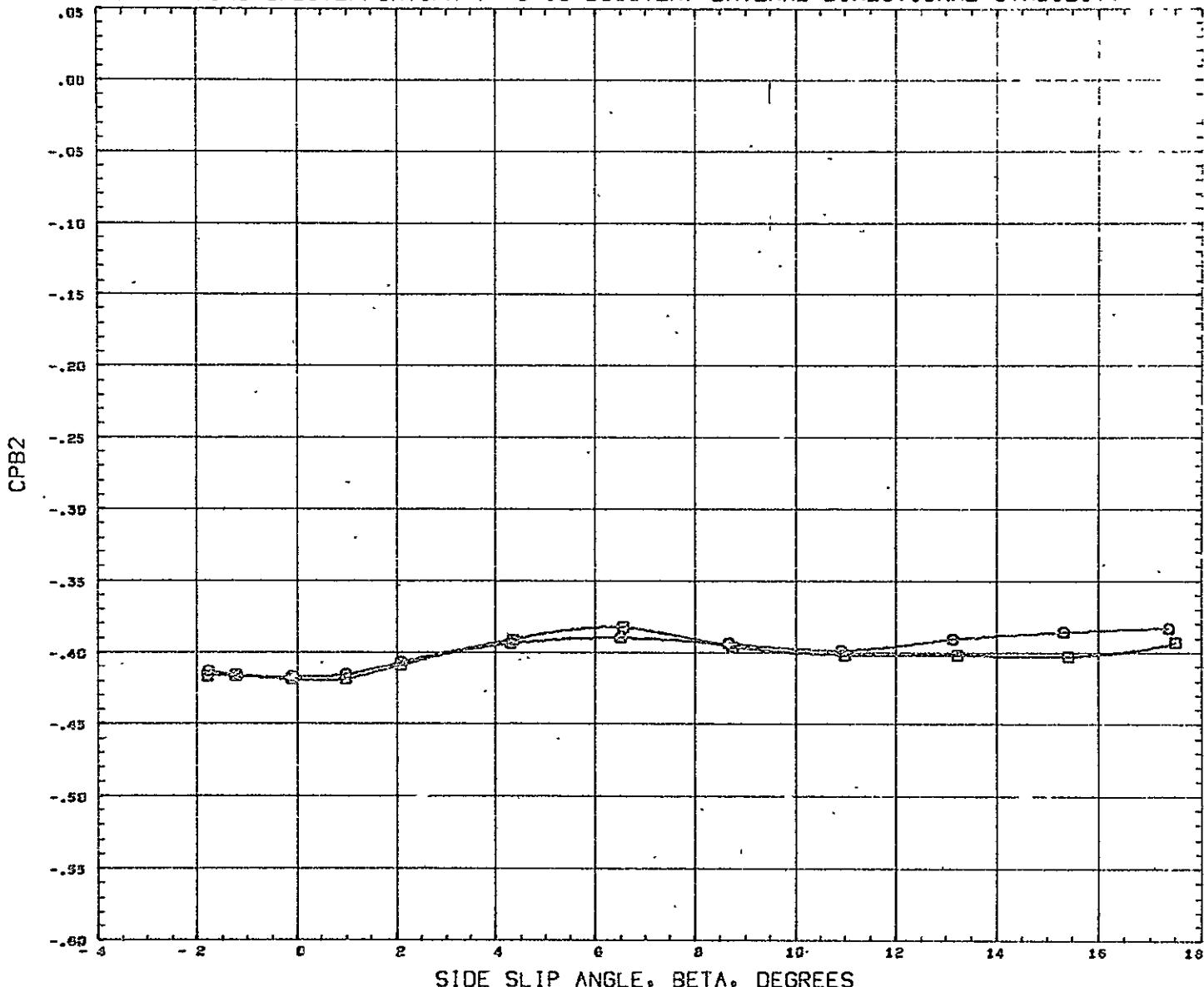
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZNRP	0.0330	INCHES
SCALE	0.0034	INCHES

MACH 0.998

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O NSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ NSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

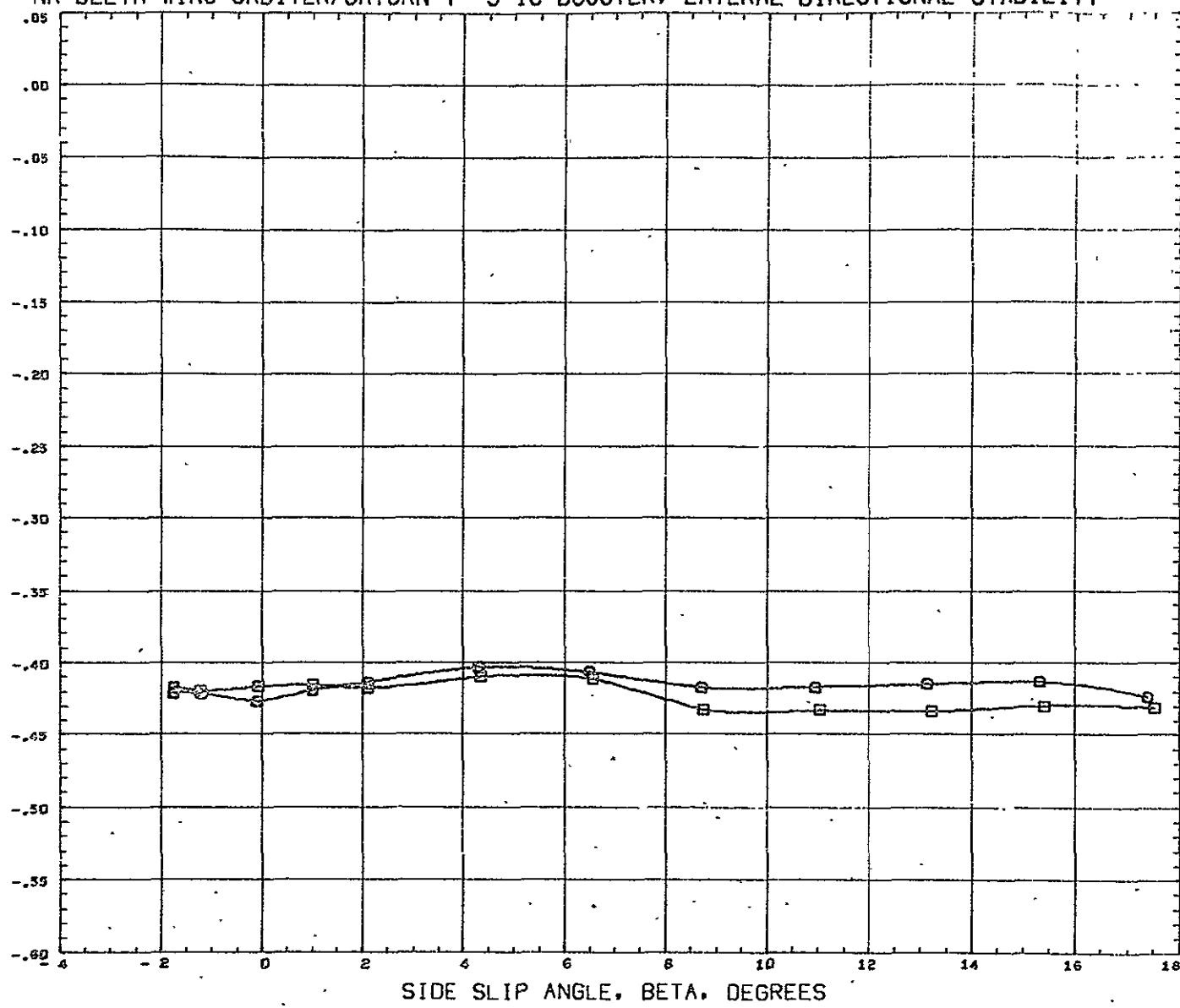
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	REFL	1.3330	INCHES
	REFB	1.3330	INCHES
	XHRF	5.2640	INCHES
	YMRF	0.0000	INCHES
	ZMRP	0.0330	INCHES
	SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPB2



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

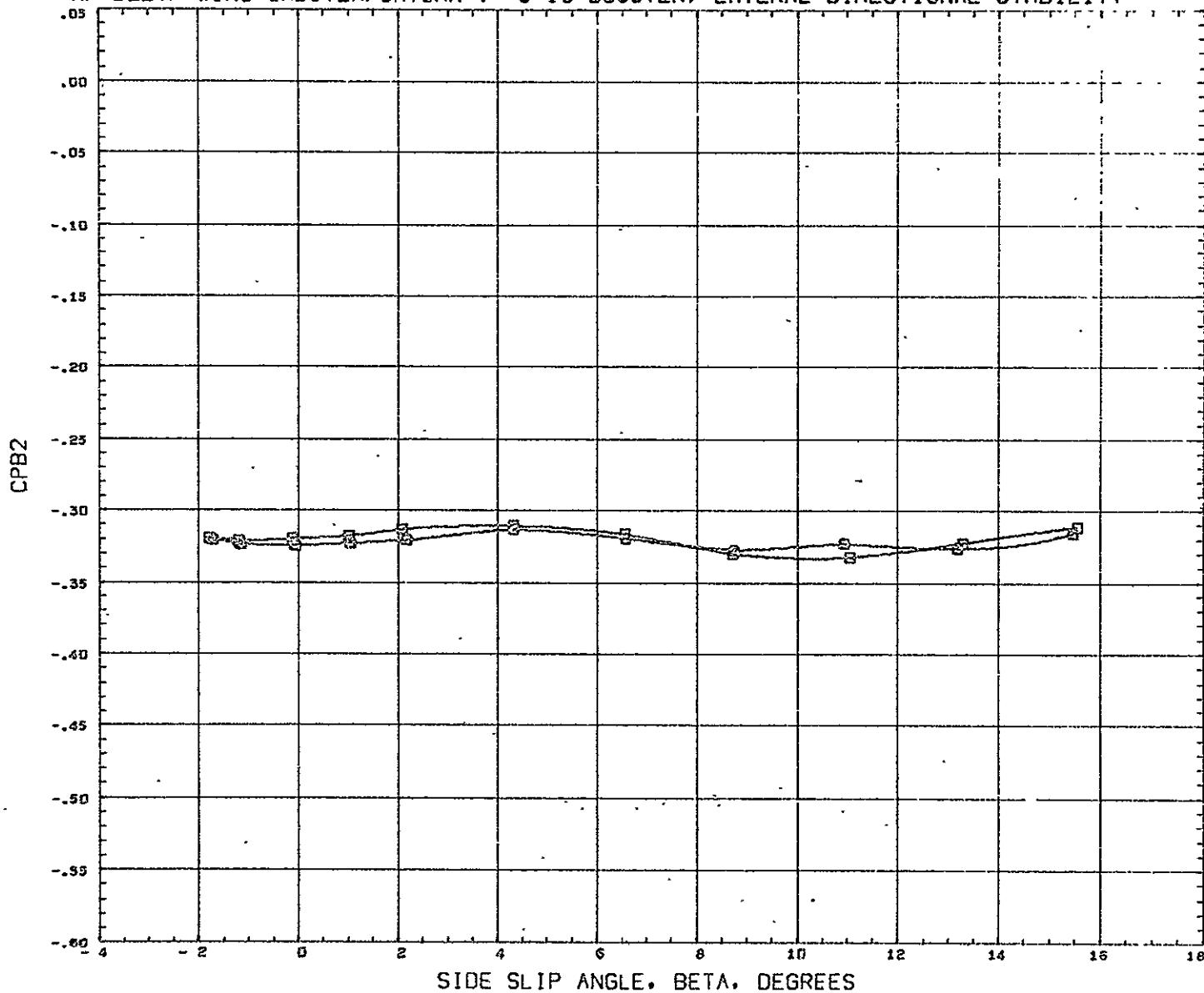
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XHRF	5.2640	INCHES			YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES			SCALE	0.0034	INCHES

MACH 1.196

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

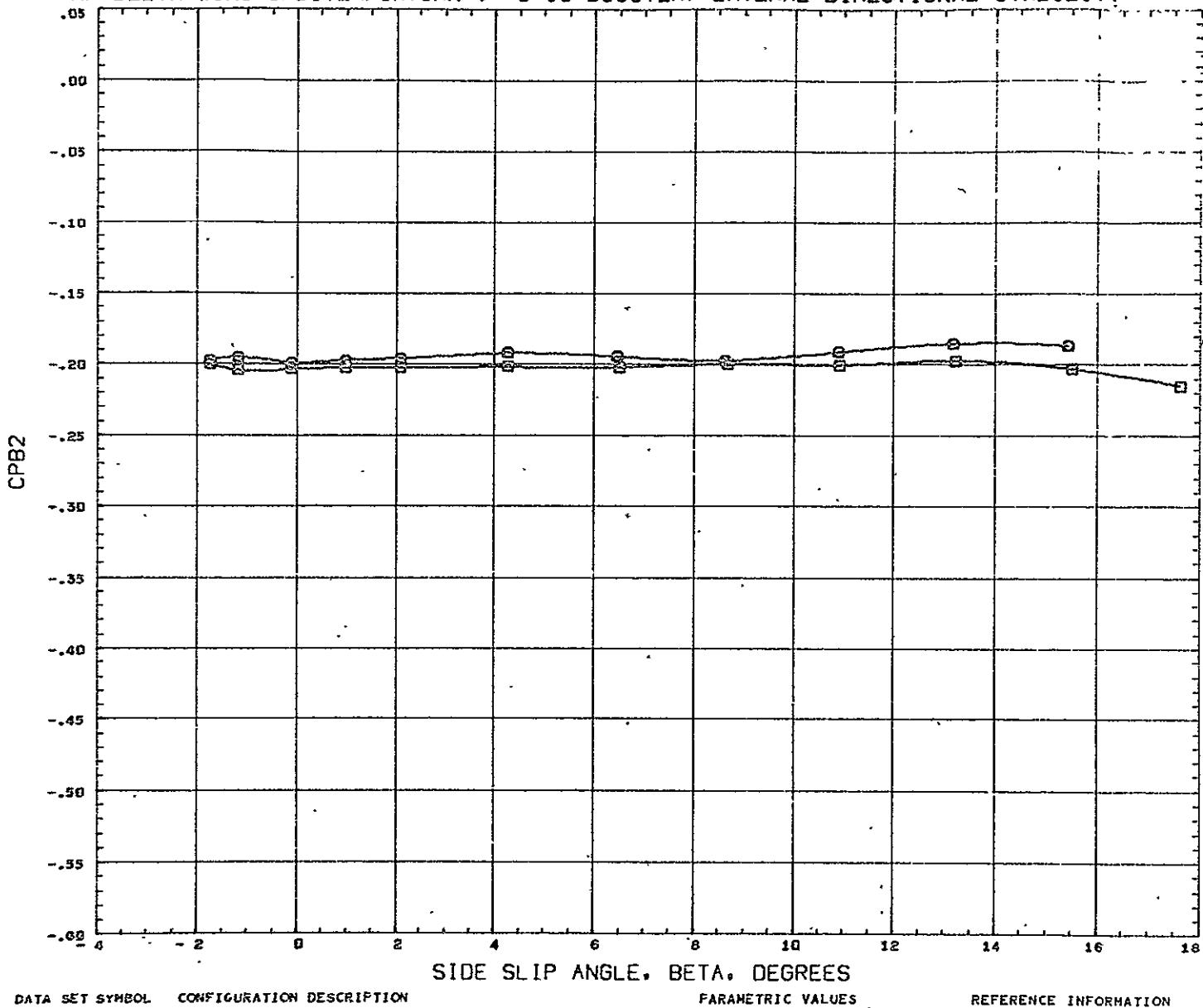


SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
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(R25093) □	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17	ORBINC 1.000	REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XHRF 5.2640 INCHES
			YMRF 0.0000 INCHES
			ZHRF 0.0330 INCHES
			SCALE 0.0034

MACH 1.455

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

SIDE SLIP ANGLE, BETA, DEGREES

PARAMETRIC VALUES

ALPHA = 0.050, ORBINC = 1.000

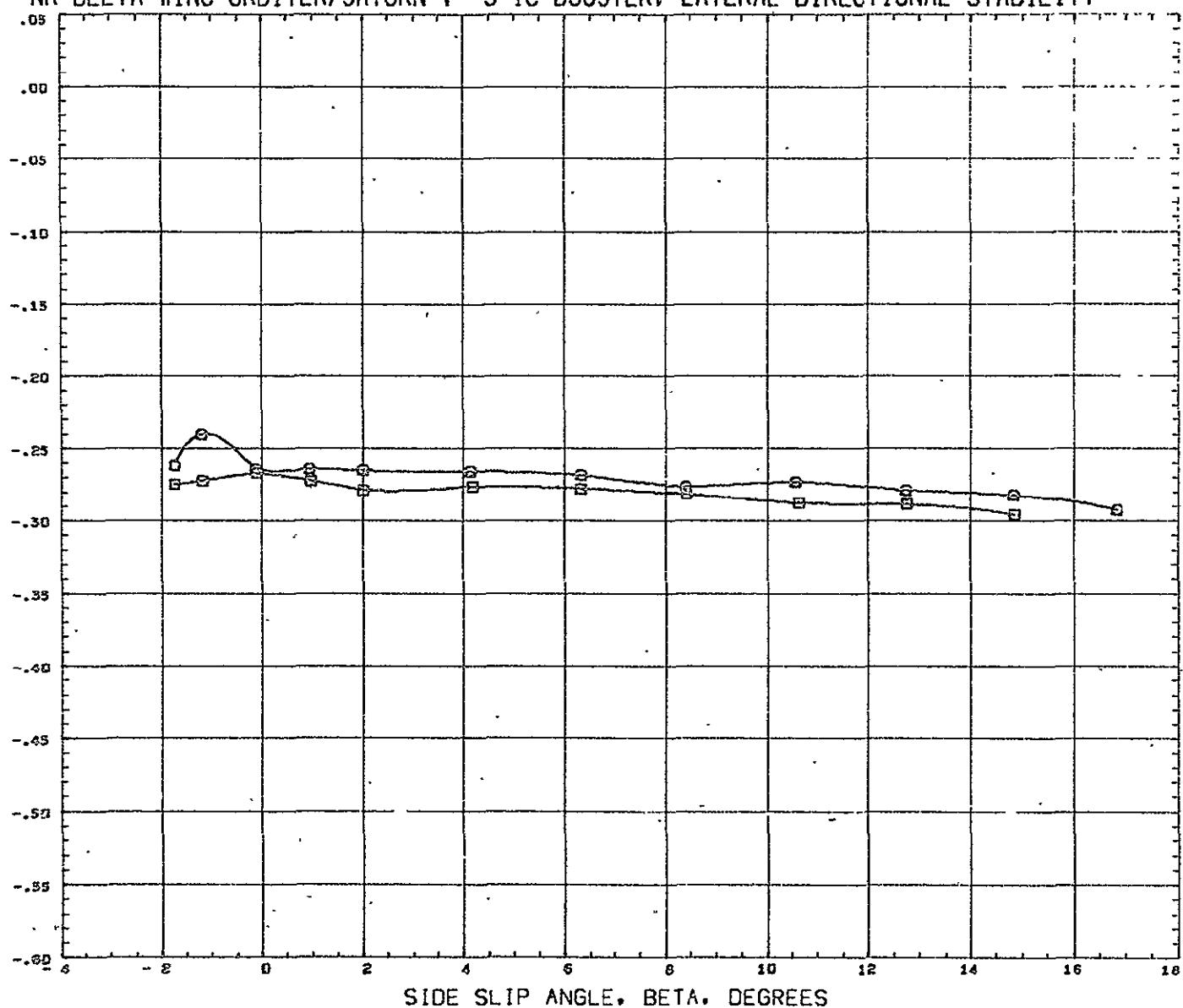
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REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0350 INCHES
SCALE 0.0034

MACH 1.959

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

CPCAV



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25033) MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

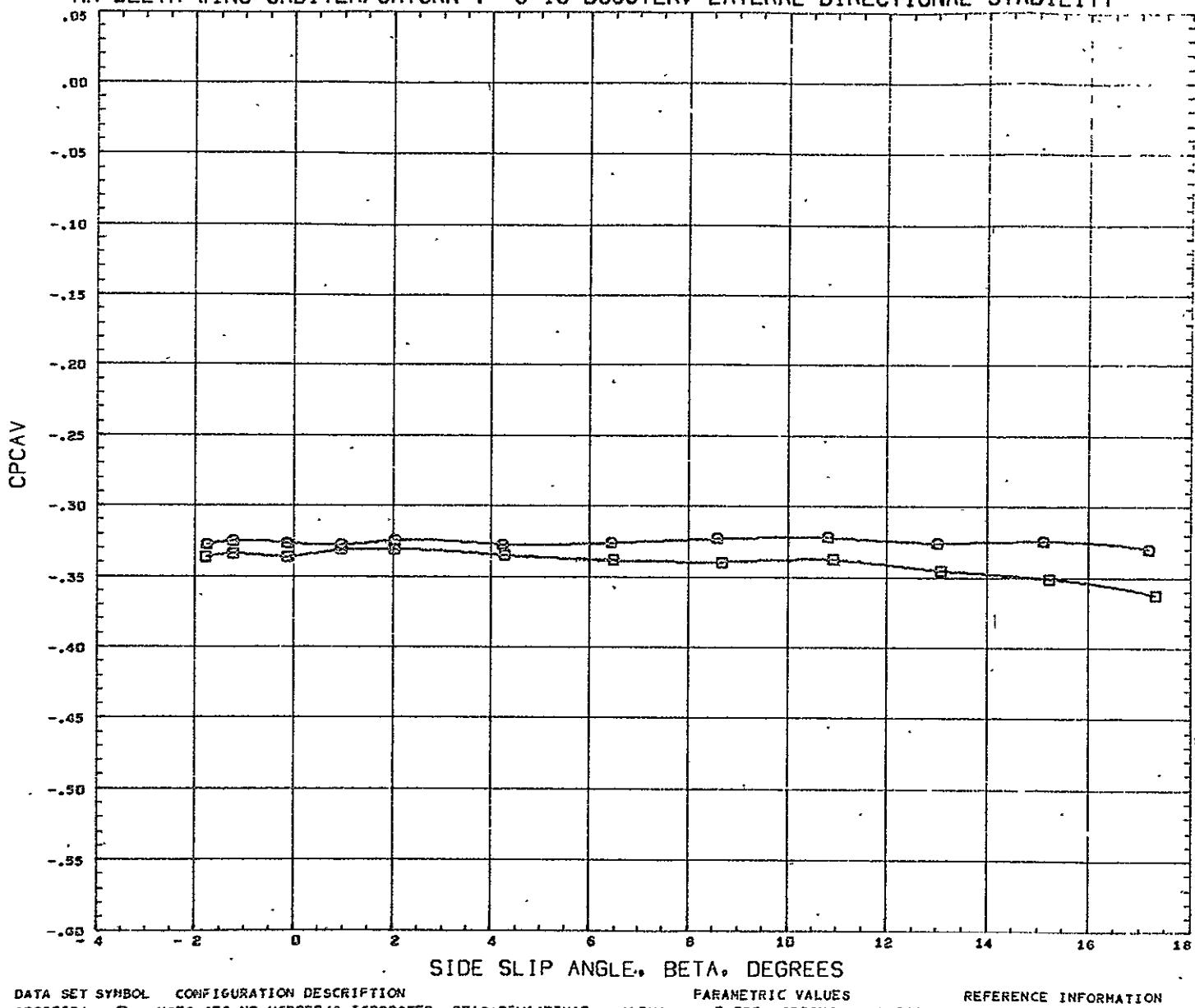
PARAMETRIC VALUES

	REFERENCE INFORMATION
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ORBINC 1.000	REFL 1.3330 INCHES
	REFB 1.3330 INCHES
	XMRP 5.2640 INCHES
	YMRP 0.0000 INCHES
	ZMRP 0.0330 INCHES
SCALE 0.0034	

MACH 0.603

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

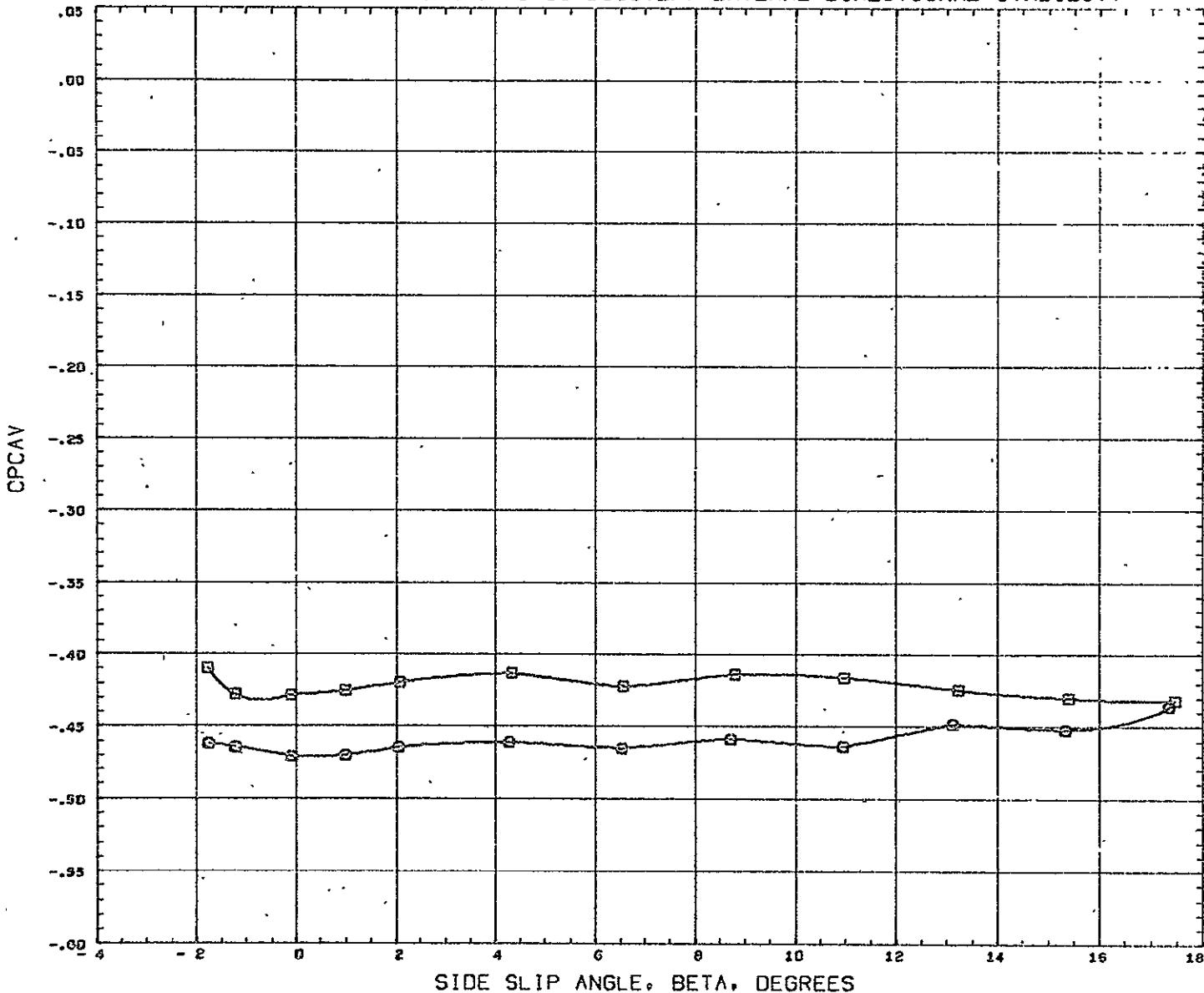
PARAMETRIC VALUES

ALPHA = 0.050 ORBINC

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XNRF	5.2640	INCHES
YNRF	0.0000	INCHES
ZNRF	0.0330	INCHES
SCALE	0.0034	INCHES

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
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PARAMETRIC VALUES

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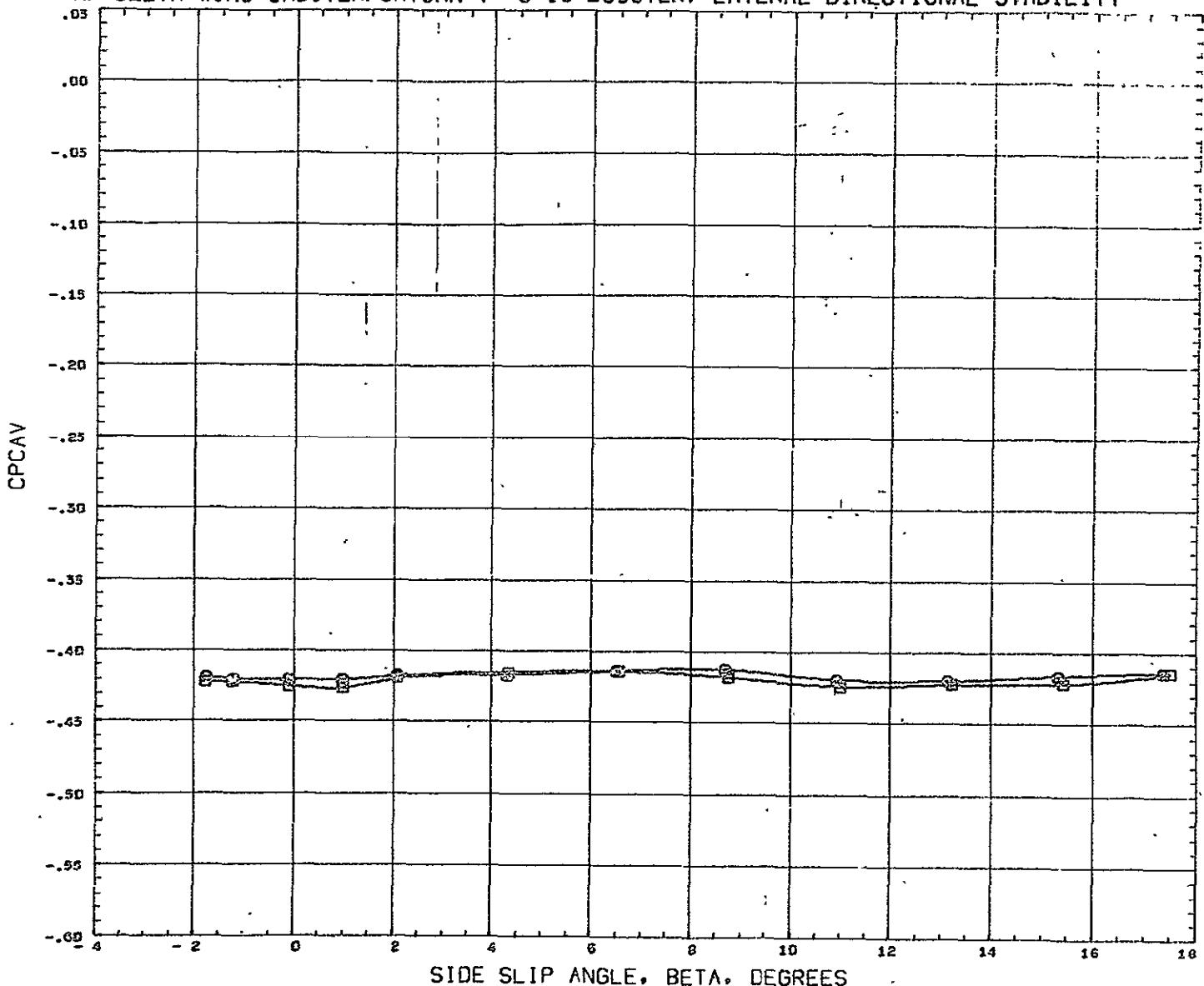
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REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

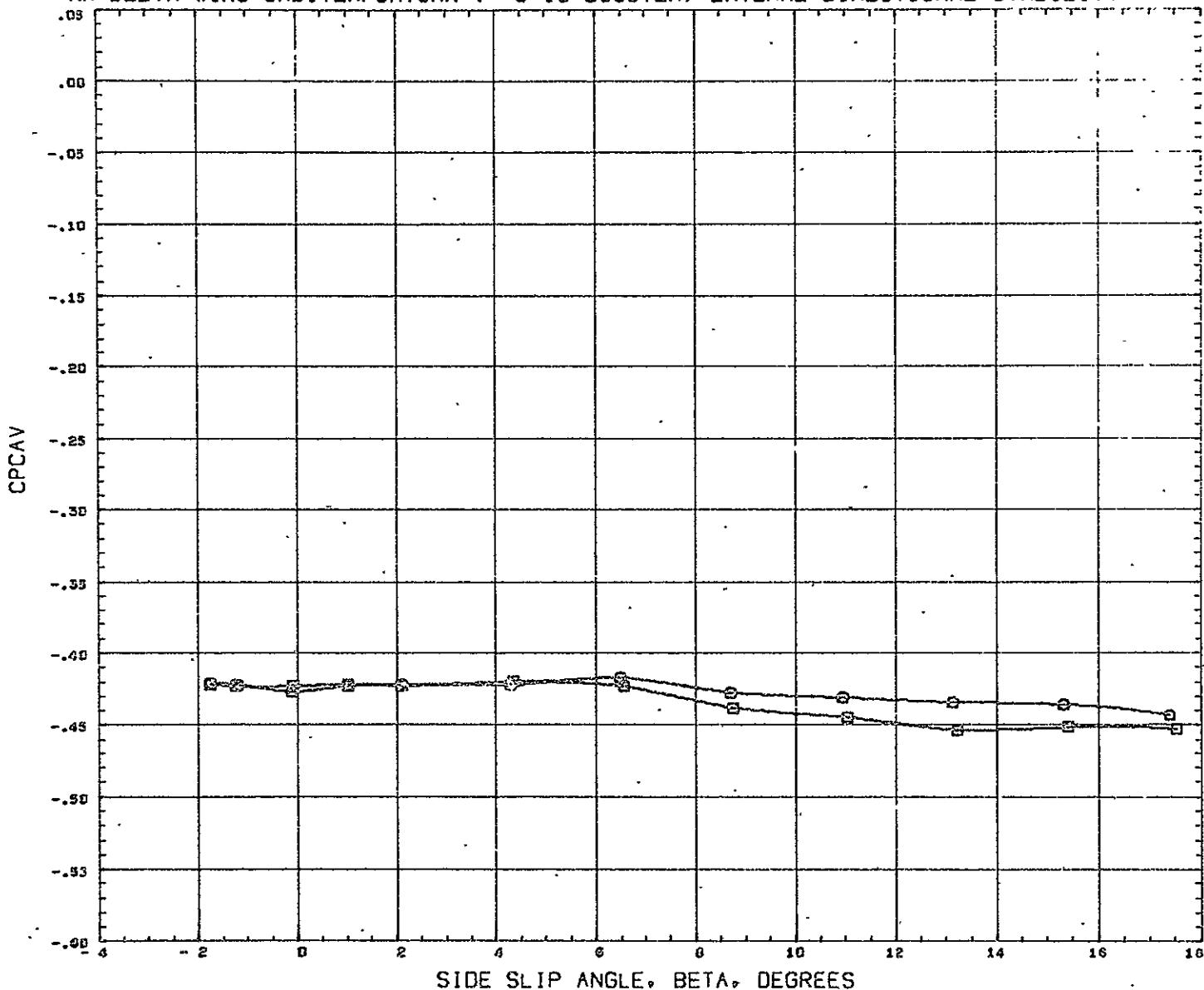
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REFERENCE INFORMATION

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XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZNRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
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(R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

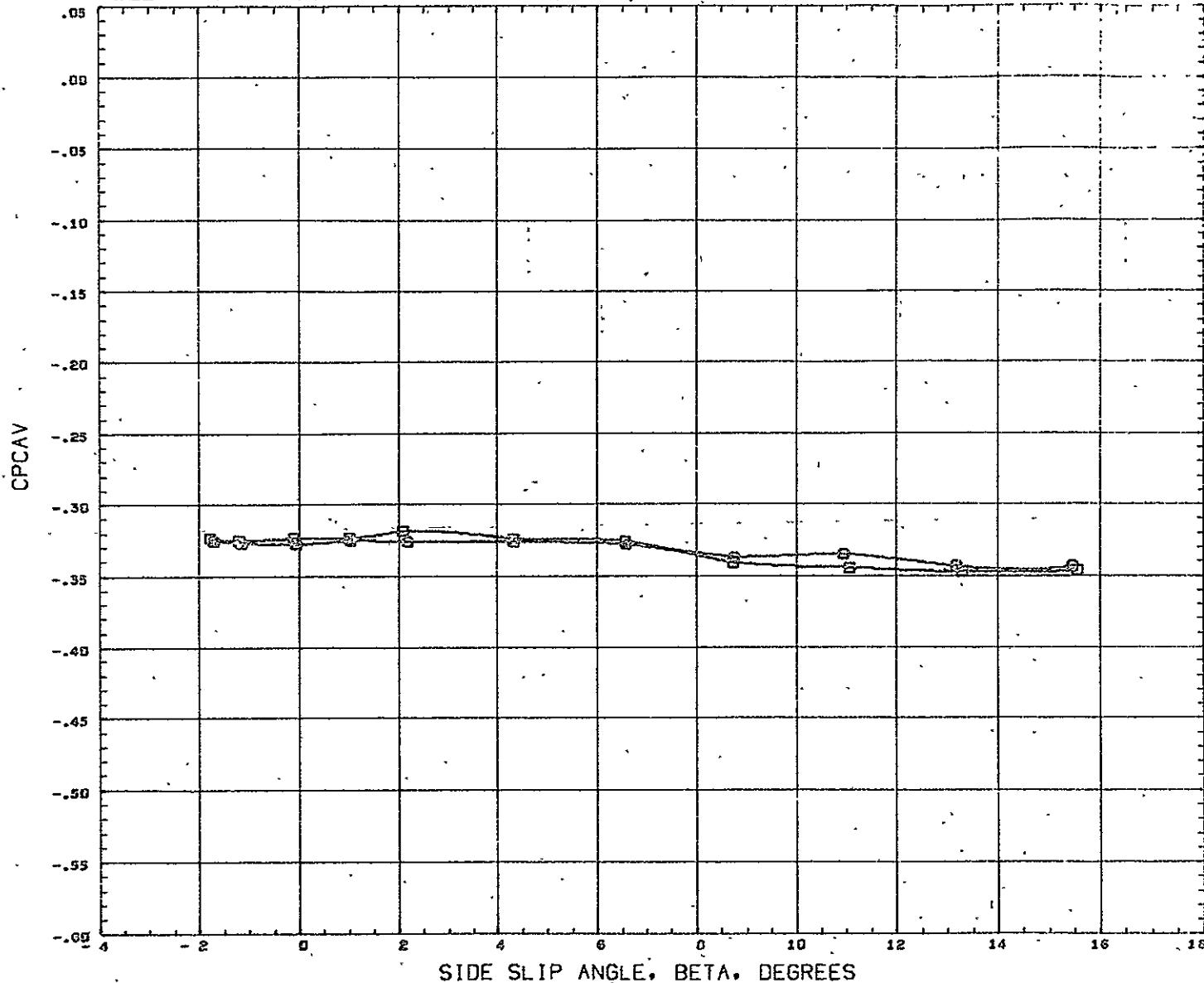
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REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.196.

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O NSFC 476 NR MCORB/S-ICBOOSTER BF1S+B5W14E3V17
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PARAMETRIC VALUES

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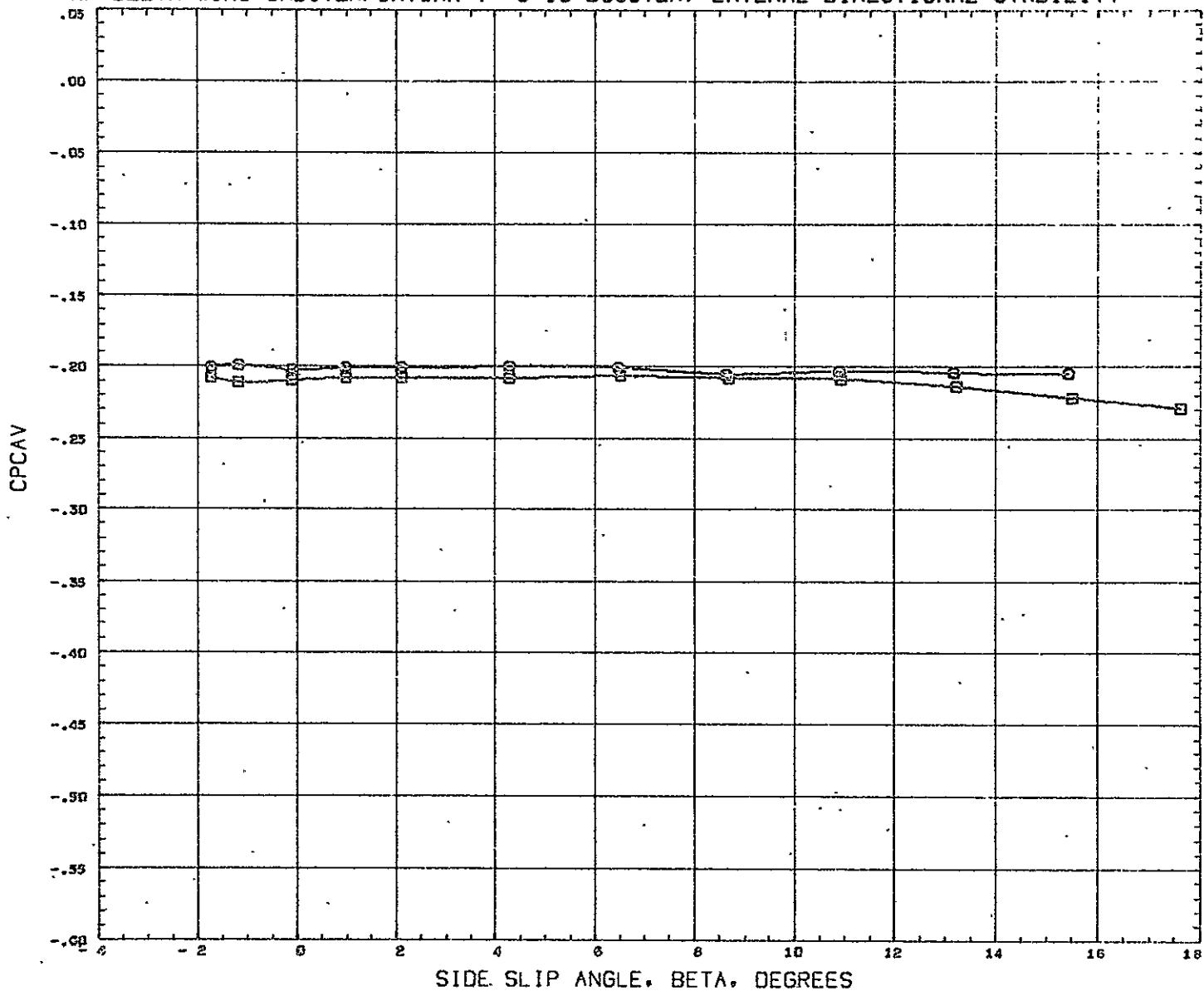
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XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

HACH 1.455

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



SIDE SLIP ANGLE, BETA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O HSFC 476 NR MCORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ HSFC 476 NR MCORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

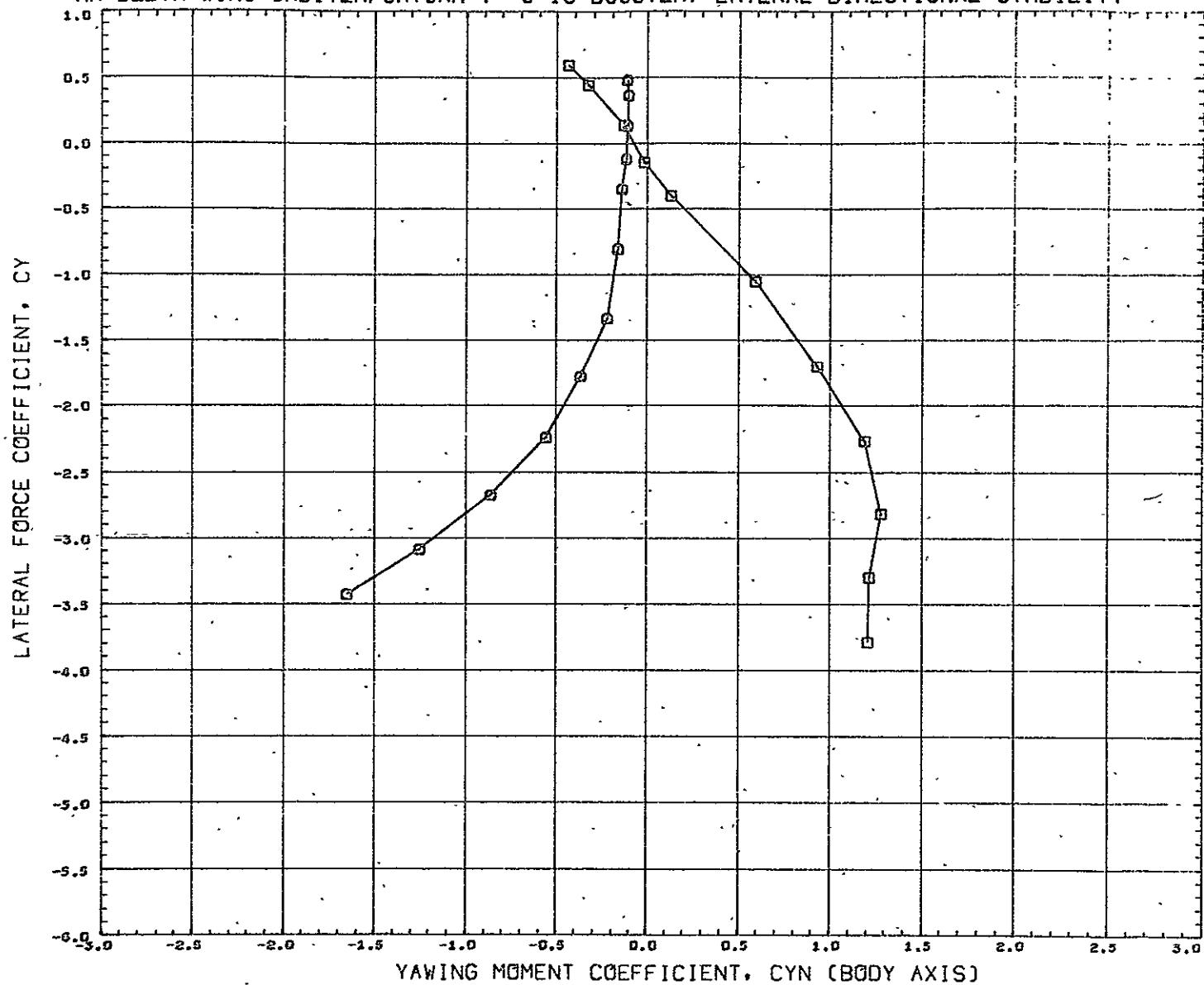
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.959

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

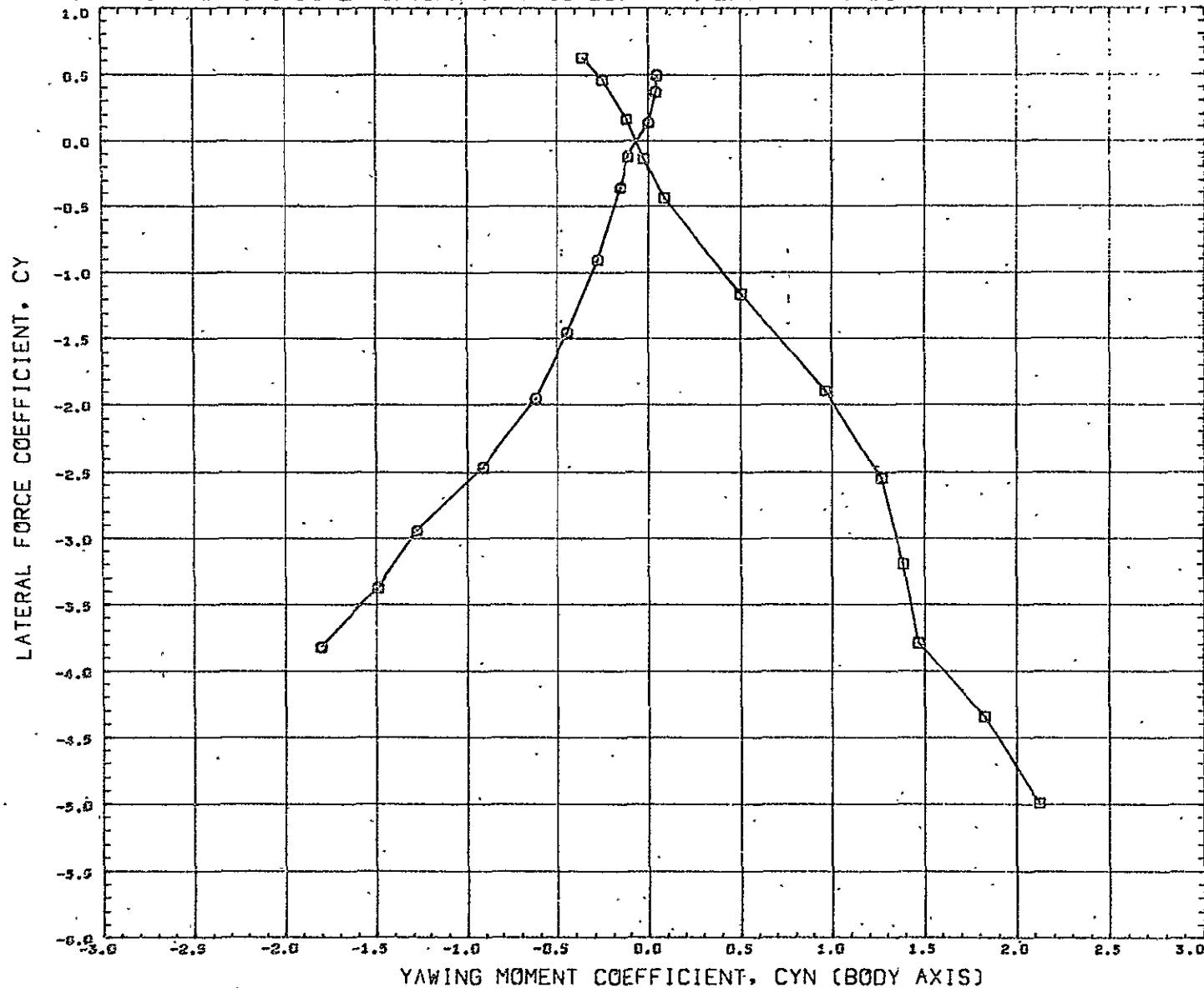
ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YMRP	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

DATA SET SYMBOL CONFIGURATION DESCRIPTION

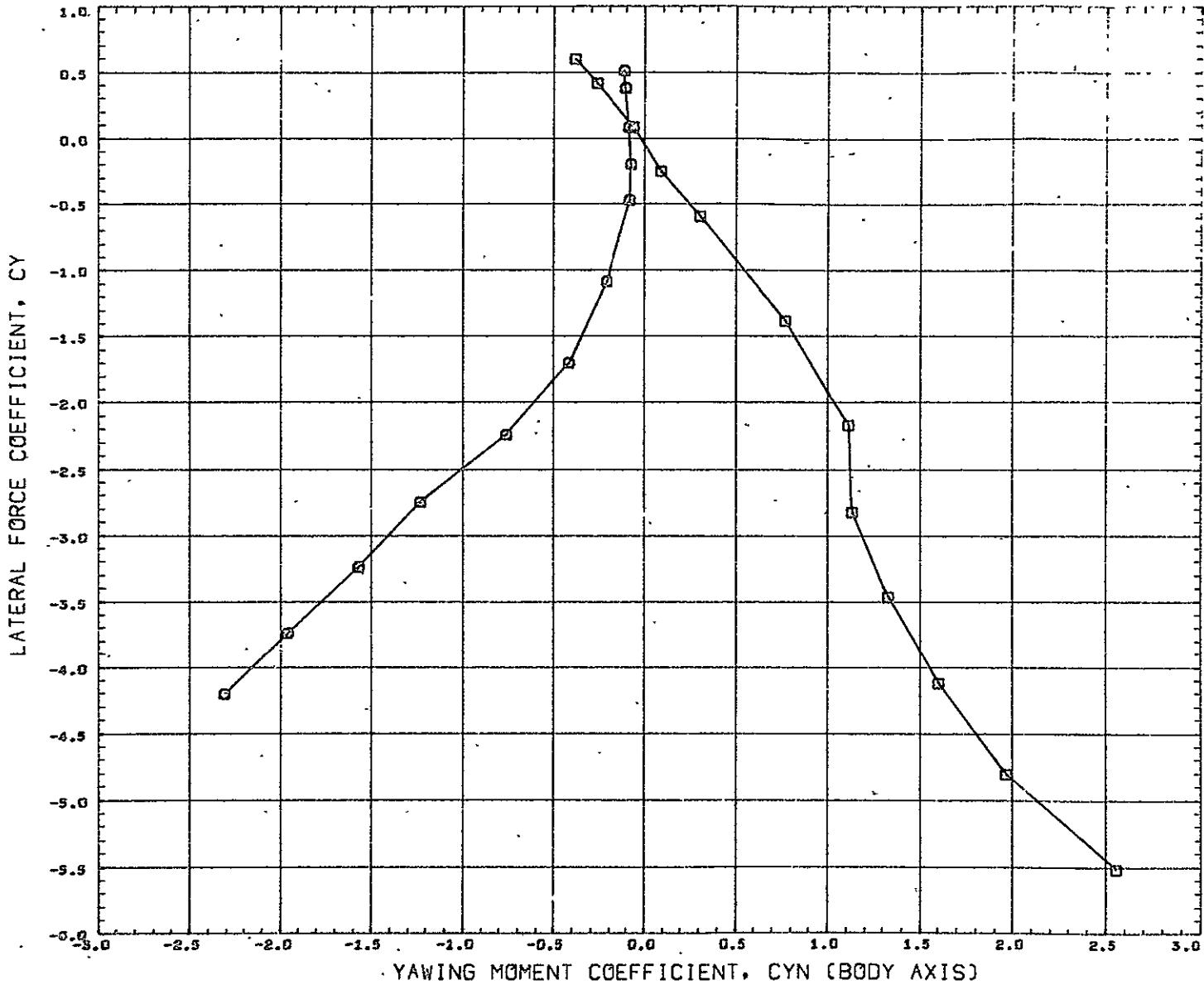
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PARAMETRIC VALUES

PARAMETER	VALUE	REFERENCE INFORMATION
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRC	5.2640	INCHES
YHRC	0.0000	INCHES
ZHRC	0.0330	INCHES
SCALE	0.0034	

MACH 0.699

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

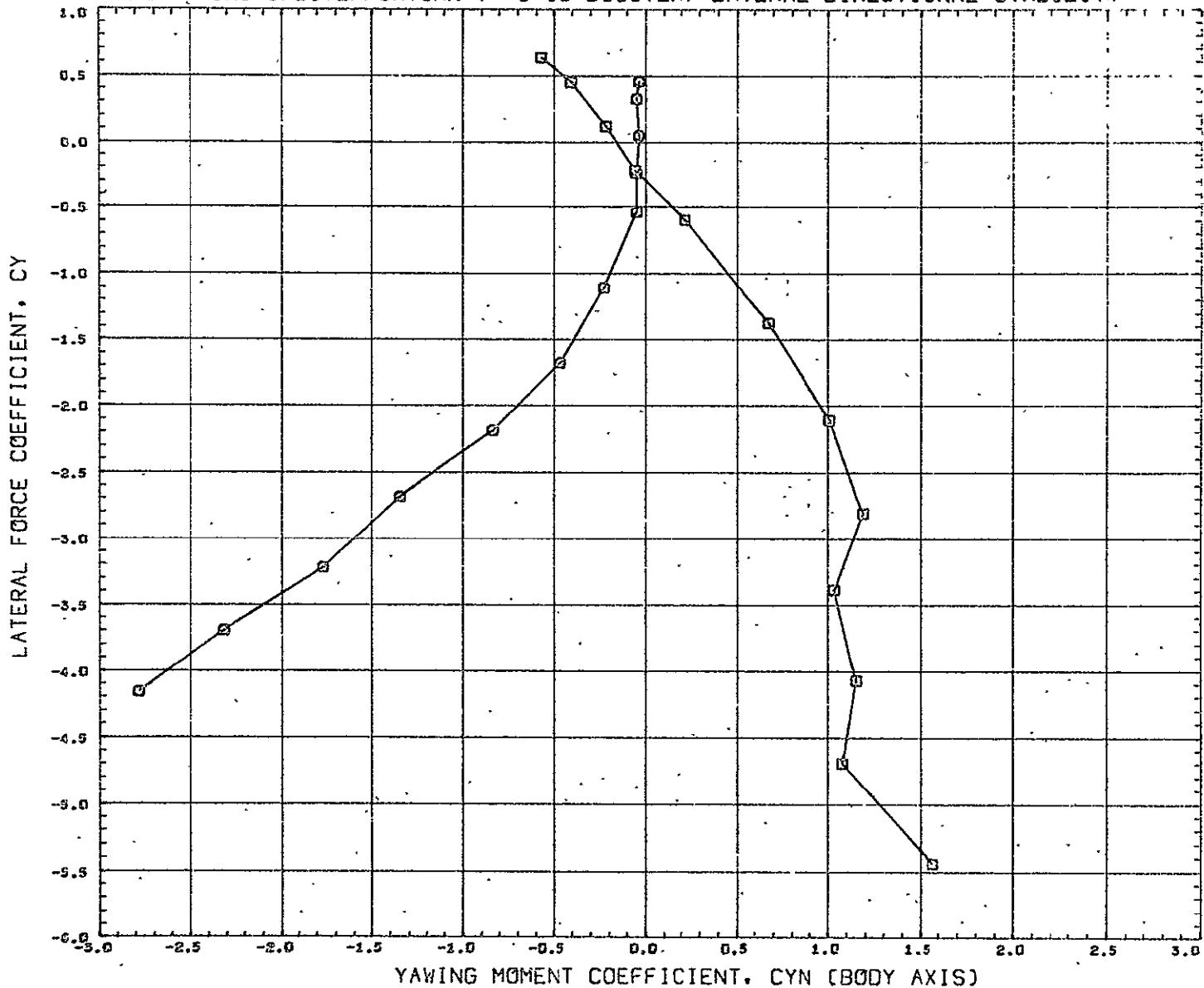


DATA SET SYMBOL CONFIGURATION DESCRIPTION
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(R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES
ALPHA = 0.050 ORBINC 1.000
REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

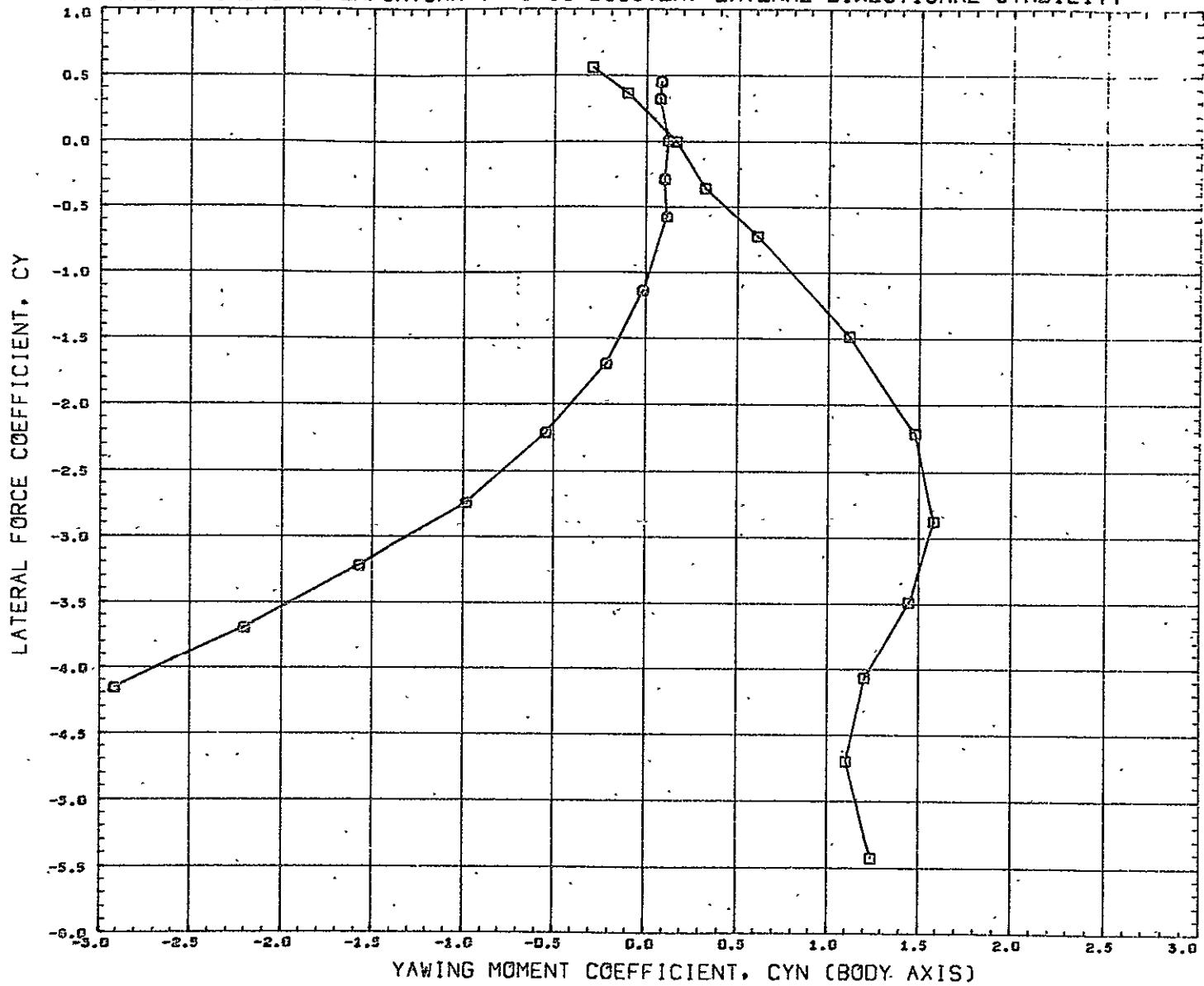


YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
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(CR25093) □	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17	REFL 1.3330 INCHES	
		REFB 1.3330 INCHES	
		XHRP 5.2640 INCHES	
		YHRP 0.0000 INCHES	
		ZHRP 0.0330 INCHES	
		SCALE 0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

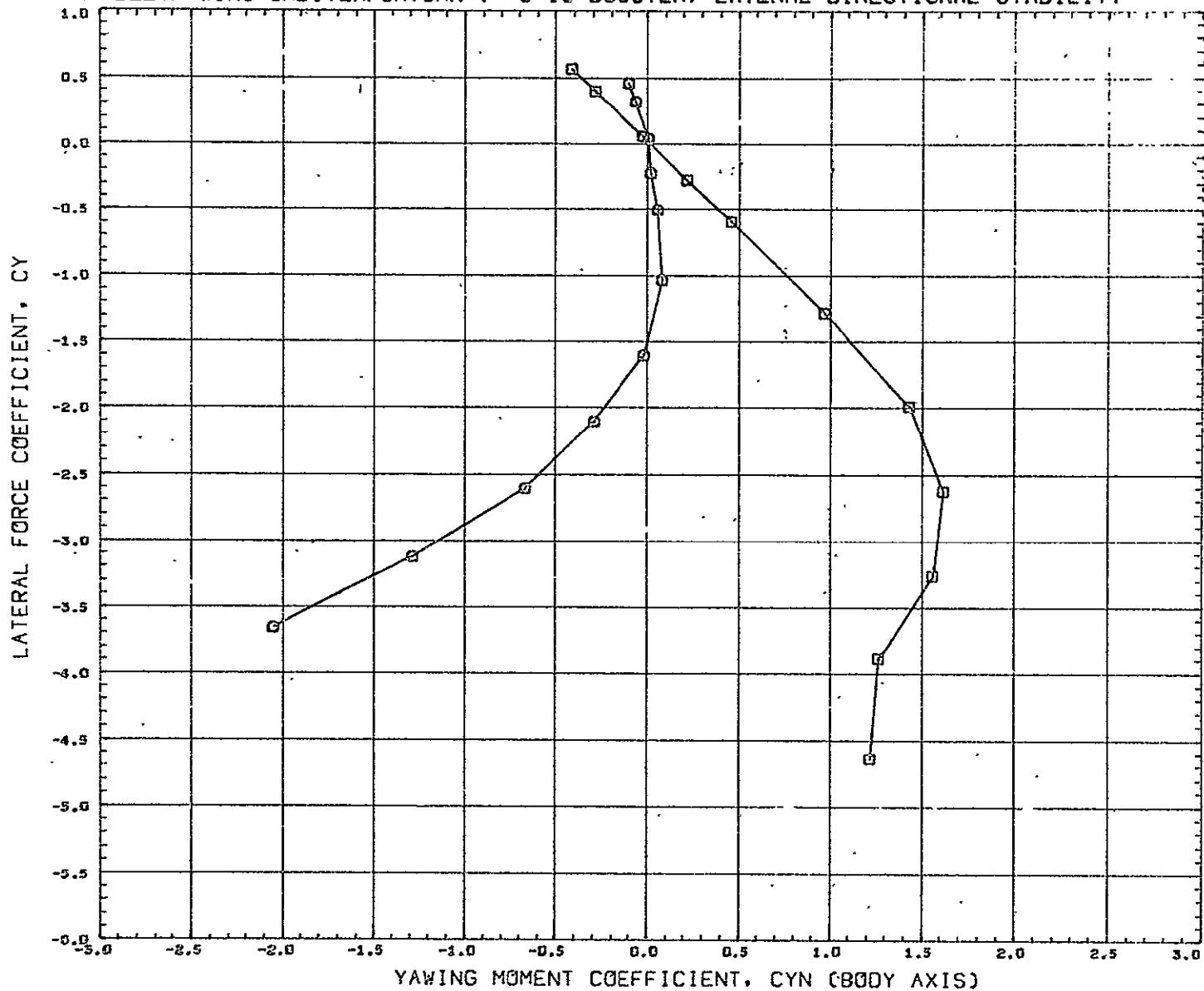


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(R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRP 5.2640 INCHES
YHRP 0.0000 INCHES
ZHRP 0.0330 INCHES
SCALE 0.0034 INCHES

MACH 1.196

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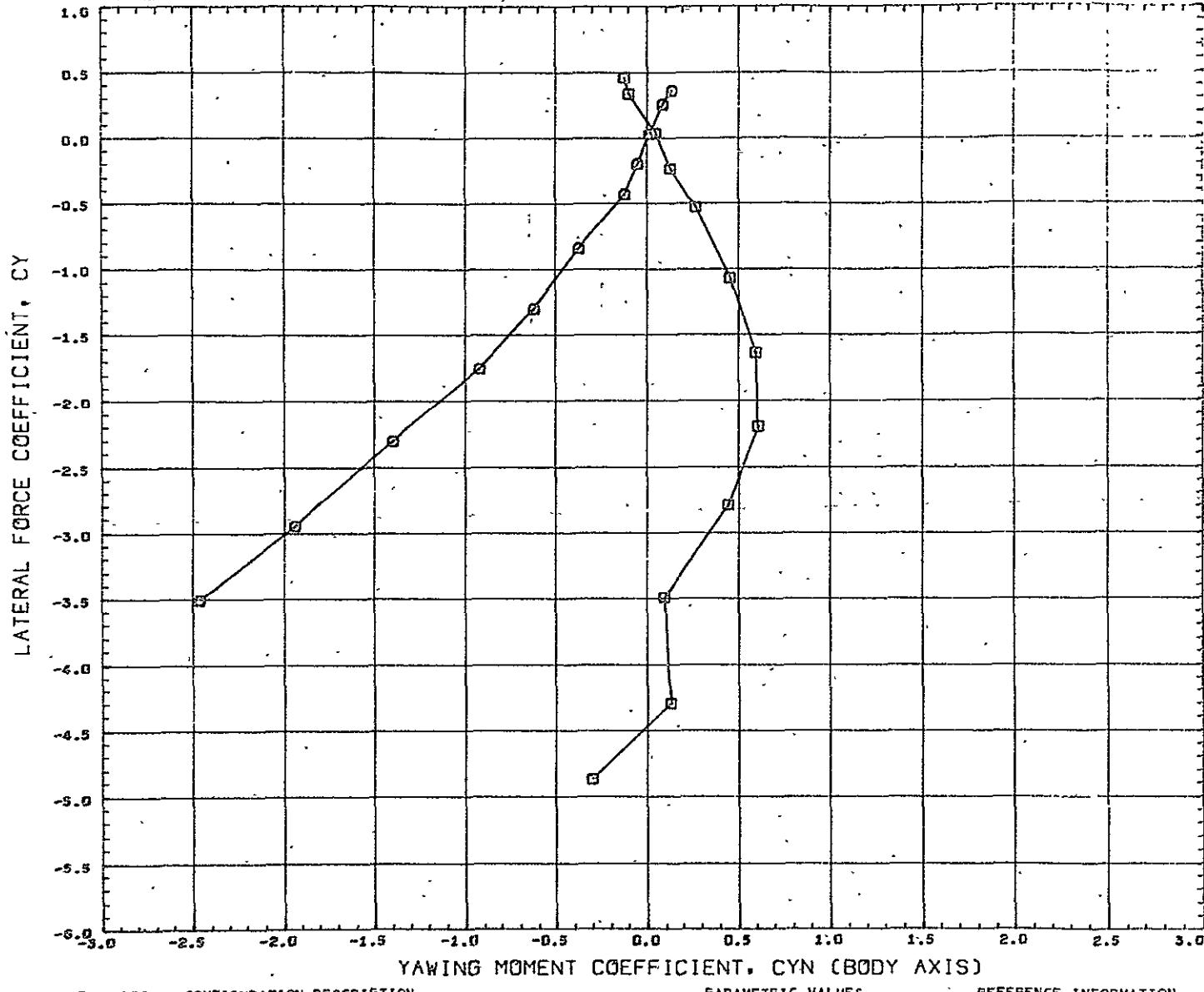
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



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(R25093) □ HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+85W14E3V17. REFL 1.3330 INCHES
REFB 1.3330 INCHES
XHRF 5.2640 INCHES
YHRF 0.0000 INCHES
ZHRF 0.0330 INCHES
SCALE 0.0034

MACH 1.455

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



YAWING MOMENT COEFFICIENT, CYN (BODY AXIS)

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

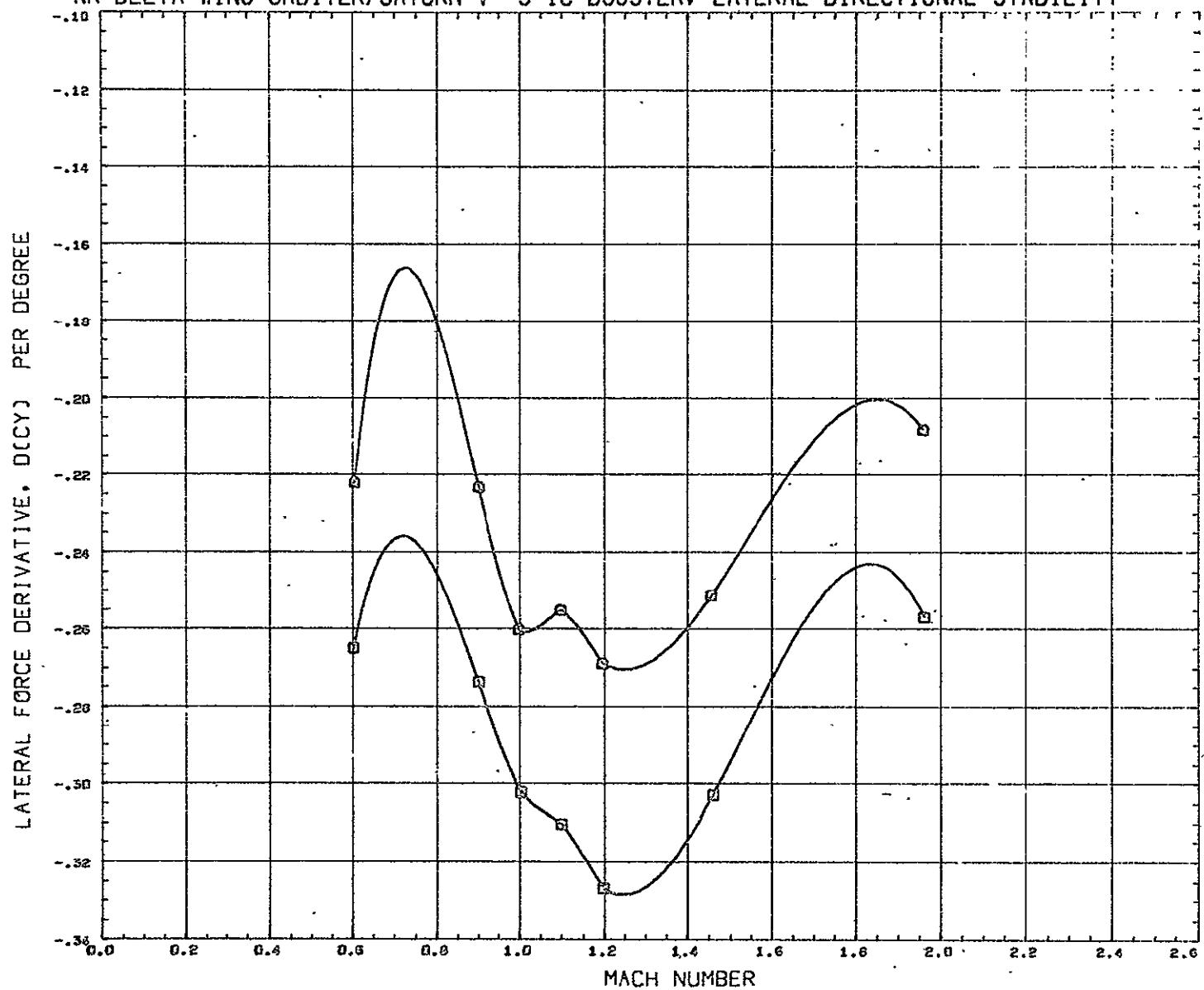
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				REFB	1.3330	INCHES
				XMRP	5.2640	INCHES
				YHRF	0.0000	INCHES
				ZMRP	0.0330	INCHES
				SCALE	0.0034	

MACH 1.959

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NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



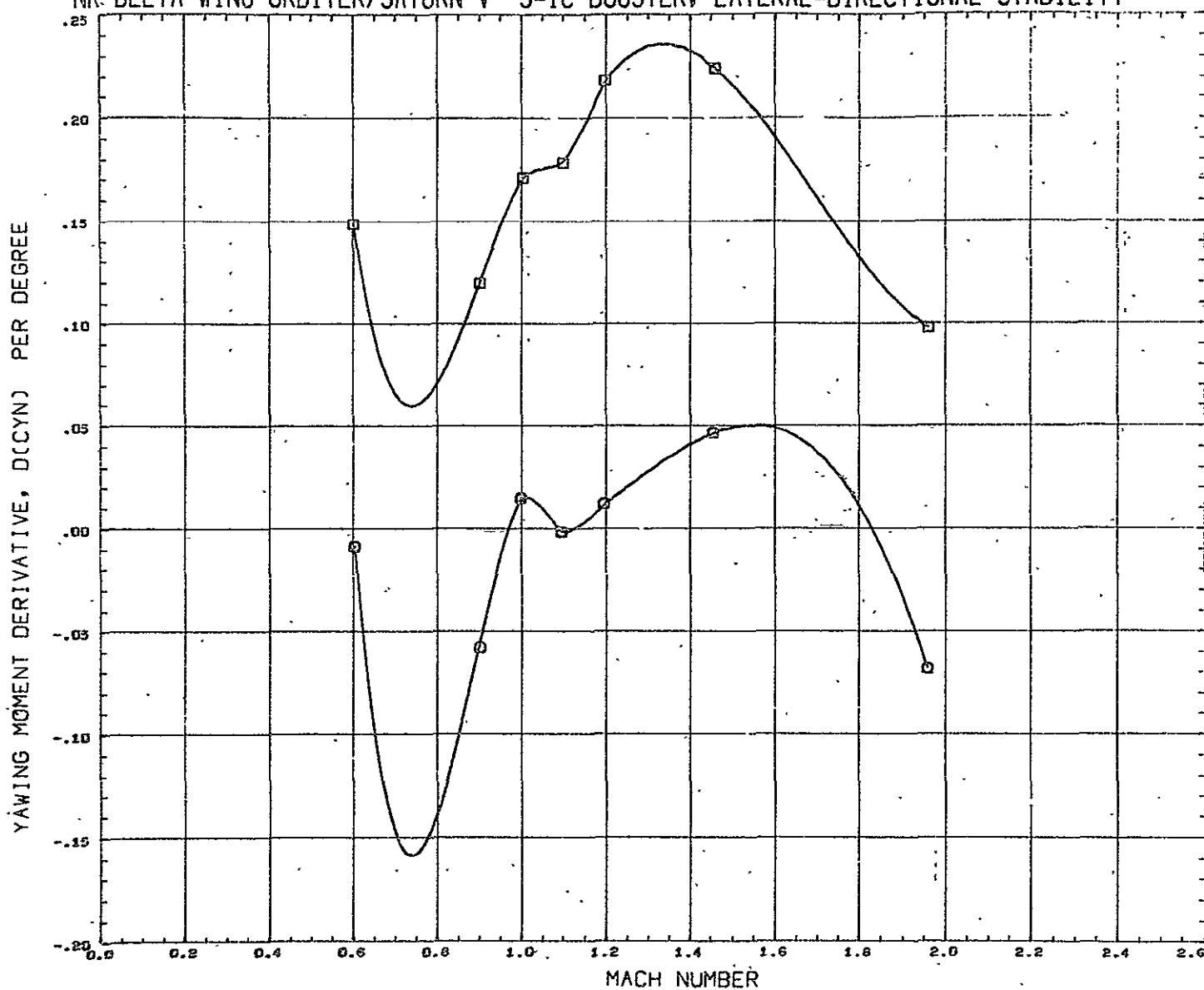
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 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5H14E3V17

PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

NR. DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25053) O NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

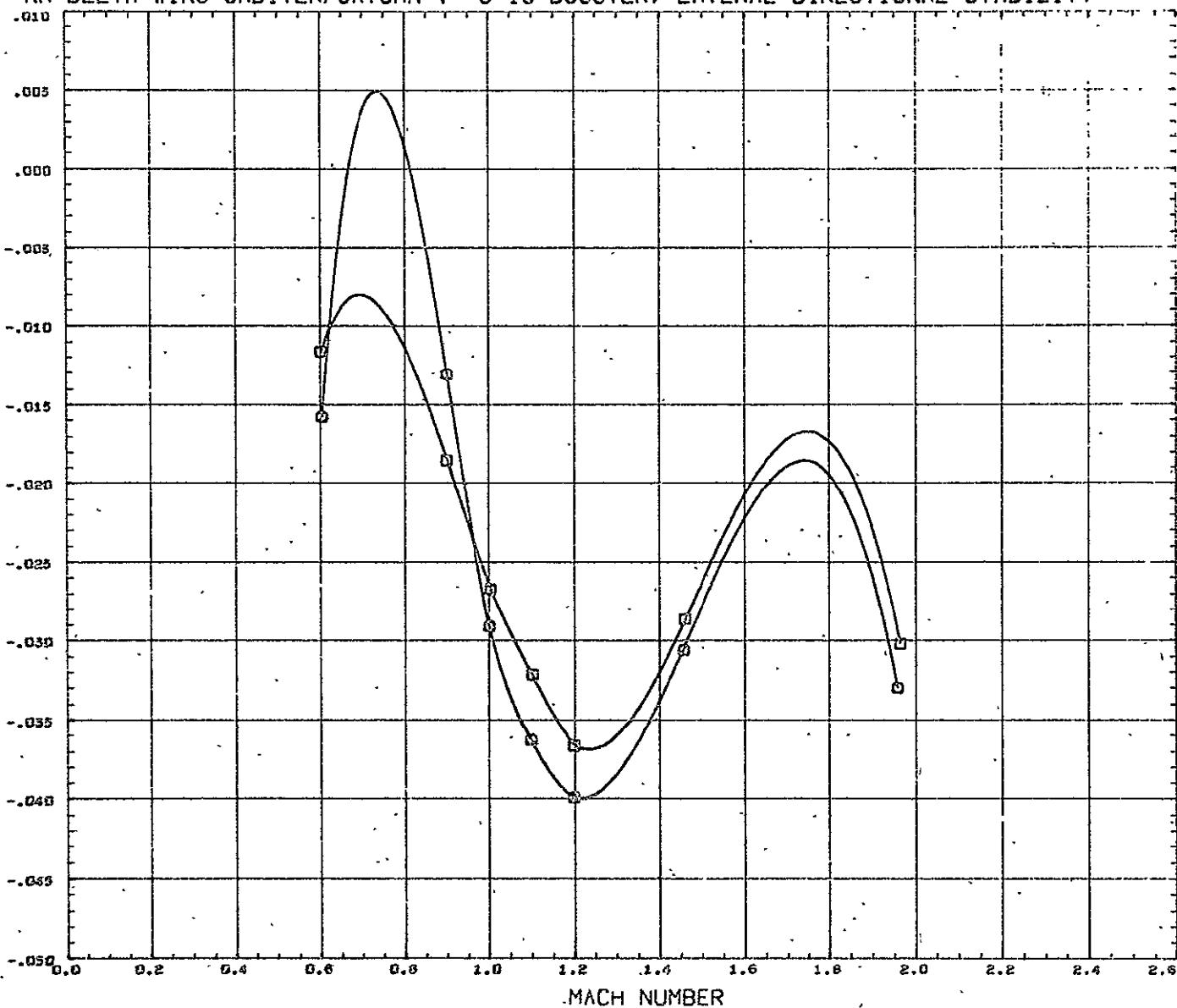
ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	INCHES

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

ROLLING MOMENT DERIVATIVE, D(CBLL) PER DEGREE)



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25053) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+BSW14E3V17
 (R25093) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+BSW14E3Y17

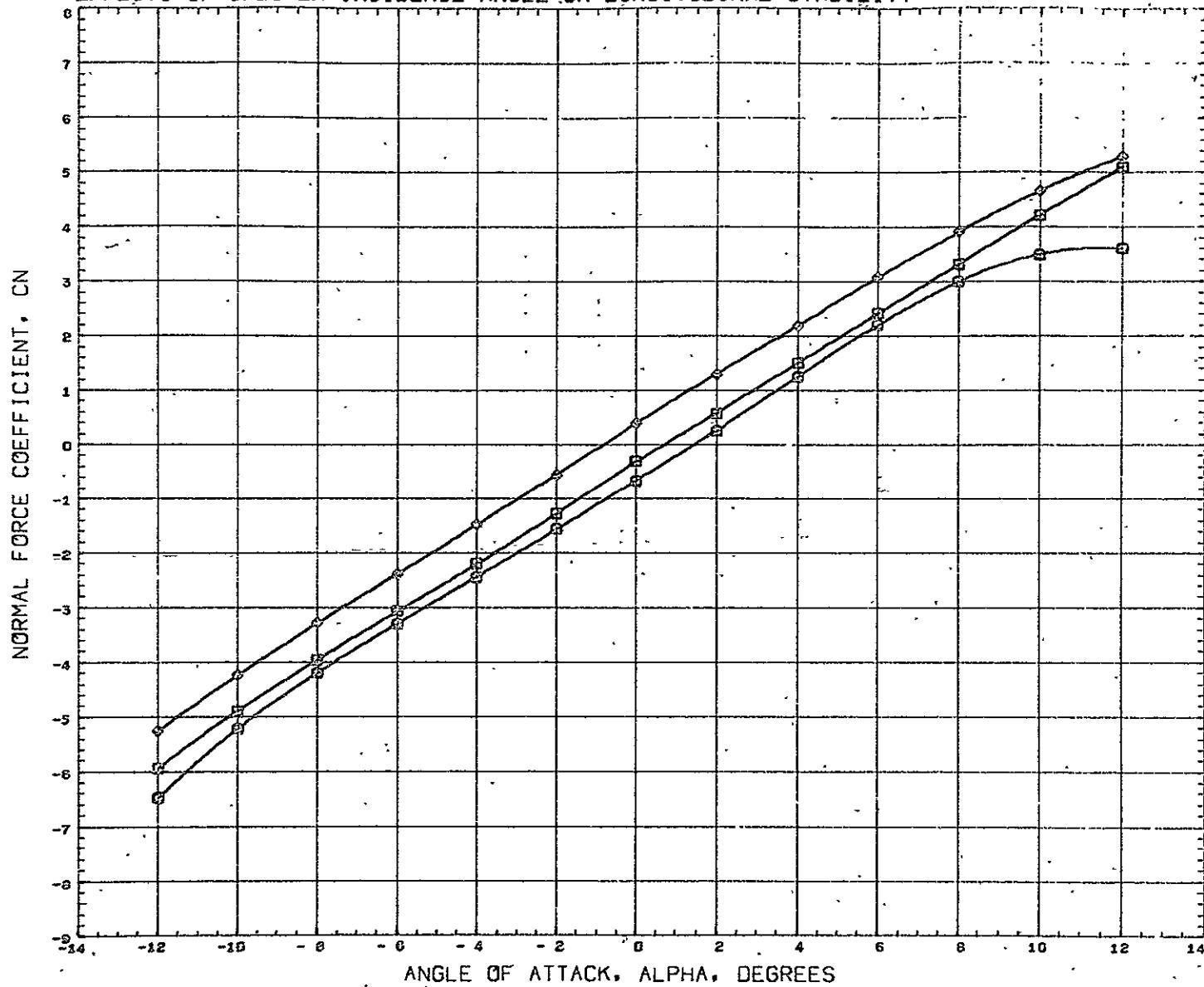
PARAMETRIC VALUES

ALPHA = 0.050 ORBINC 1.000

REFERENCE INFORMATION

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REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



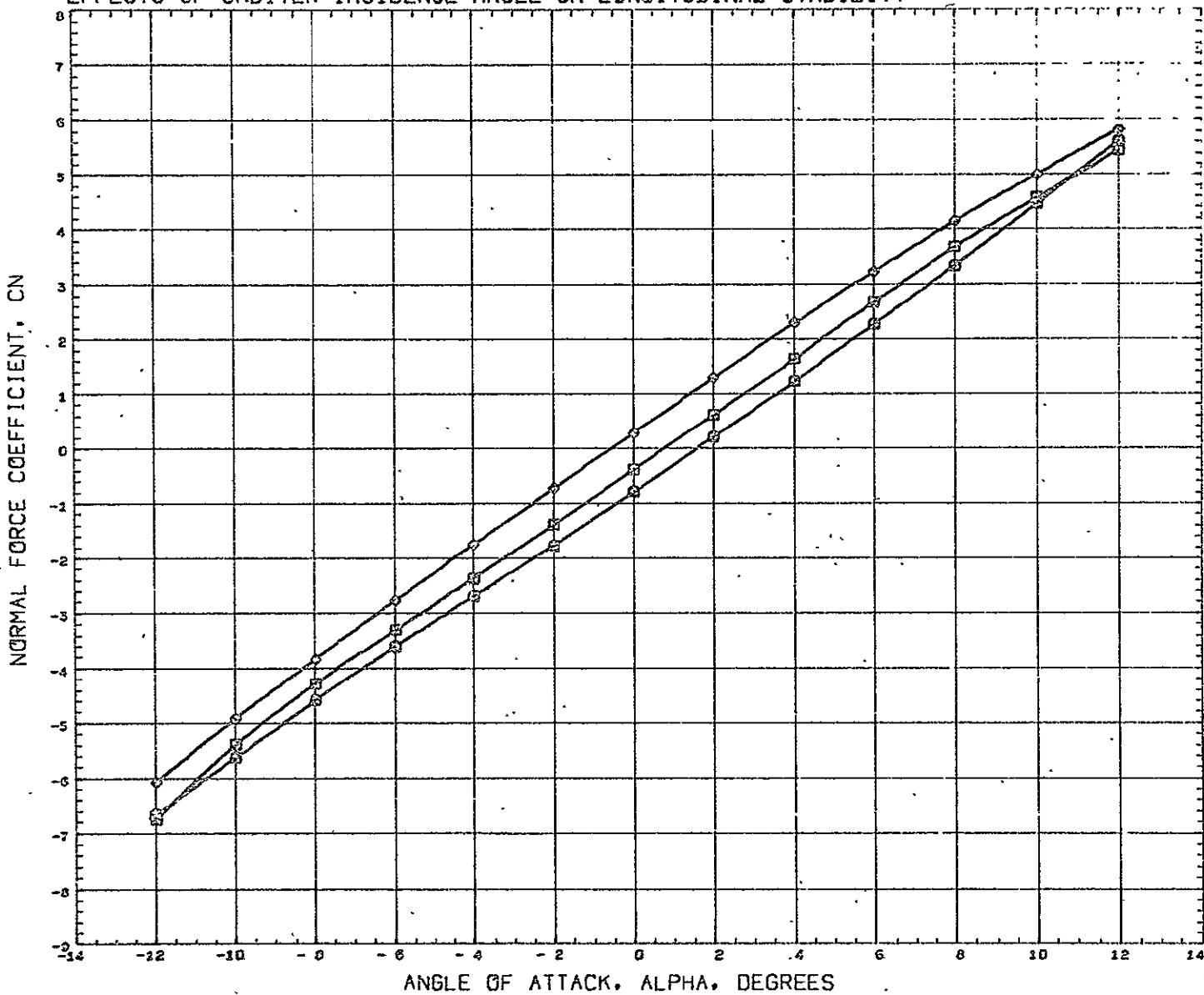
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○	- 2.000			0.010
□	1.000			
◊	4.000			

DATA LIST FILE MMIE

REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 186

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



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□	1.000		
◊	4.000		

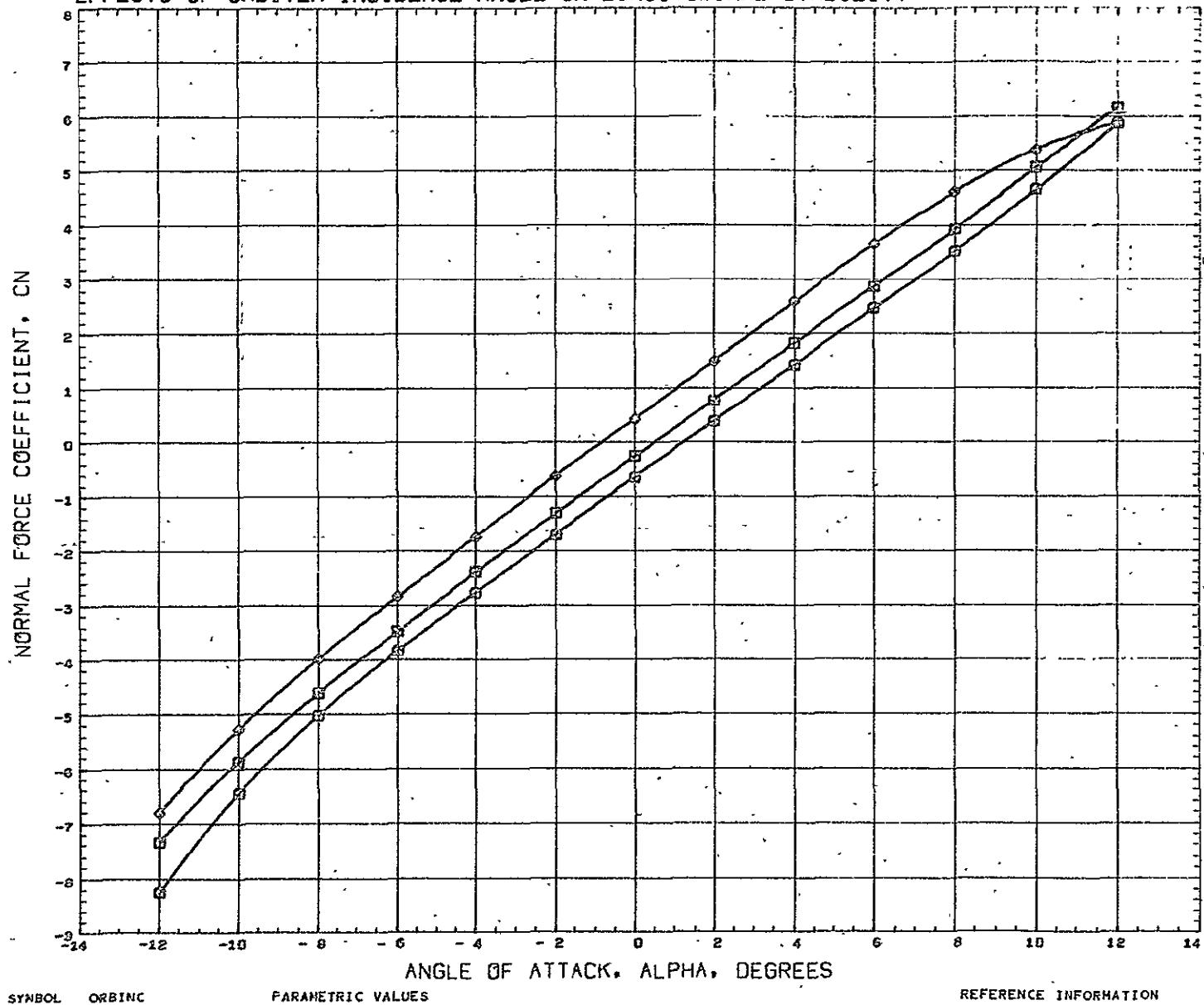
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REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE UNIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 187

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EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



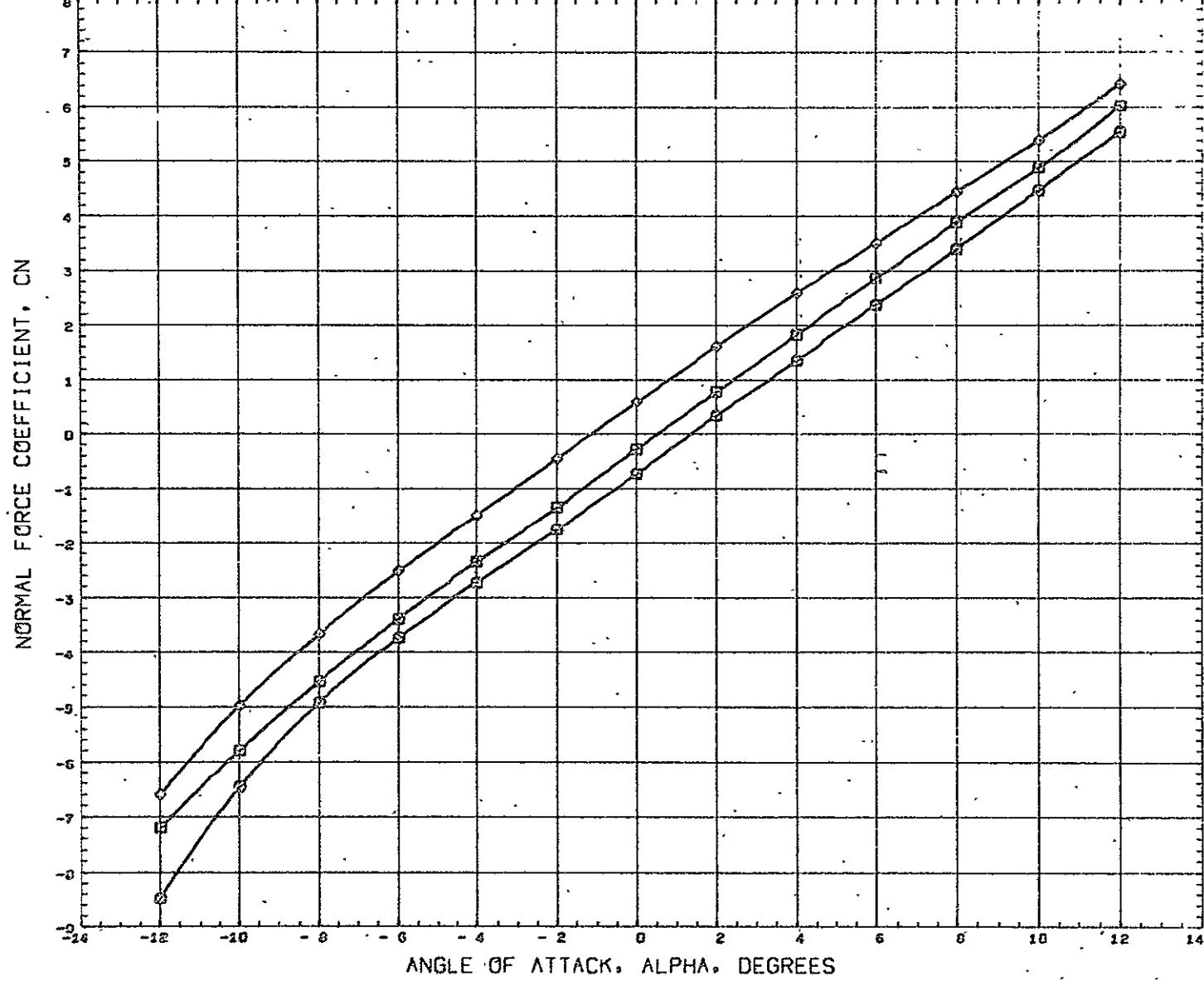
		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.000	BETA
○	- 2.000			0.010
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
FS	1.3960	SQ. IN.
FCL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (A250410) 14 JAN 71 PAGE 188

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

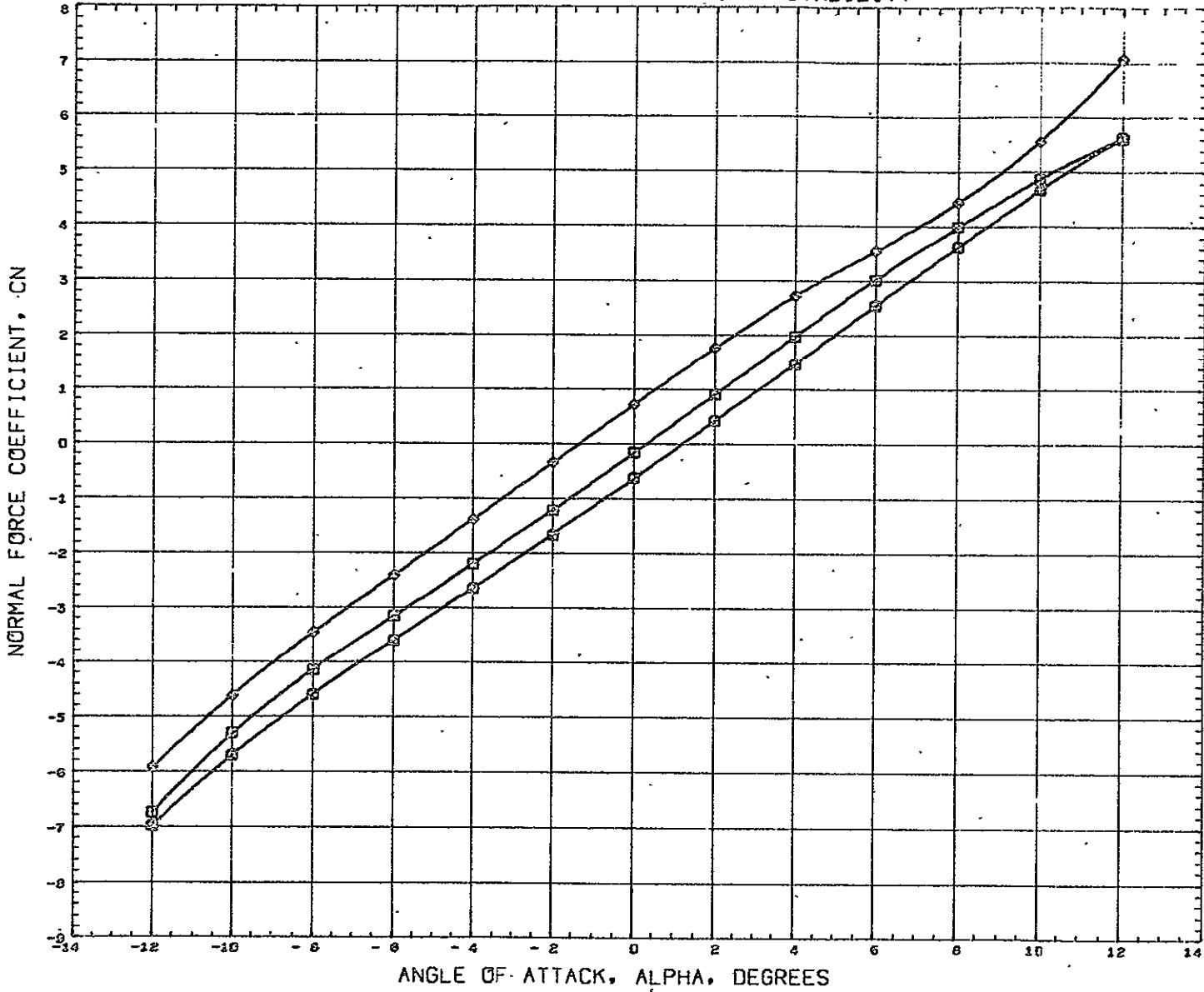


SYMBOL ORBINC PARAMETRIC VALUES
 □ - 2.000 MACH 1.100 BETA 0.010
 □ 1.000
 □ 4.000

DATA HIST. CODE HHIF

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
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 SCALE 0.0034

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



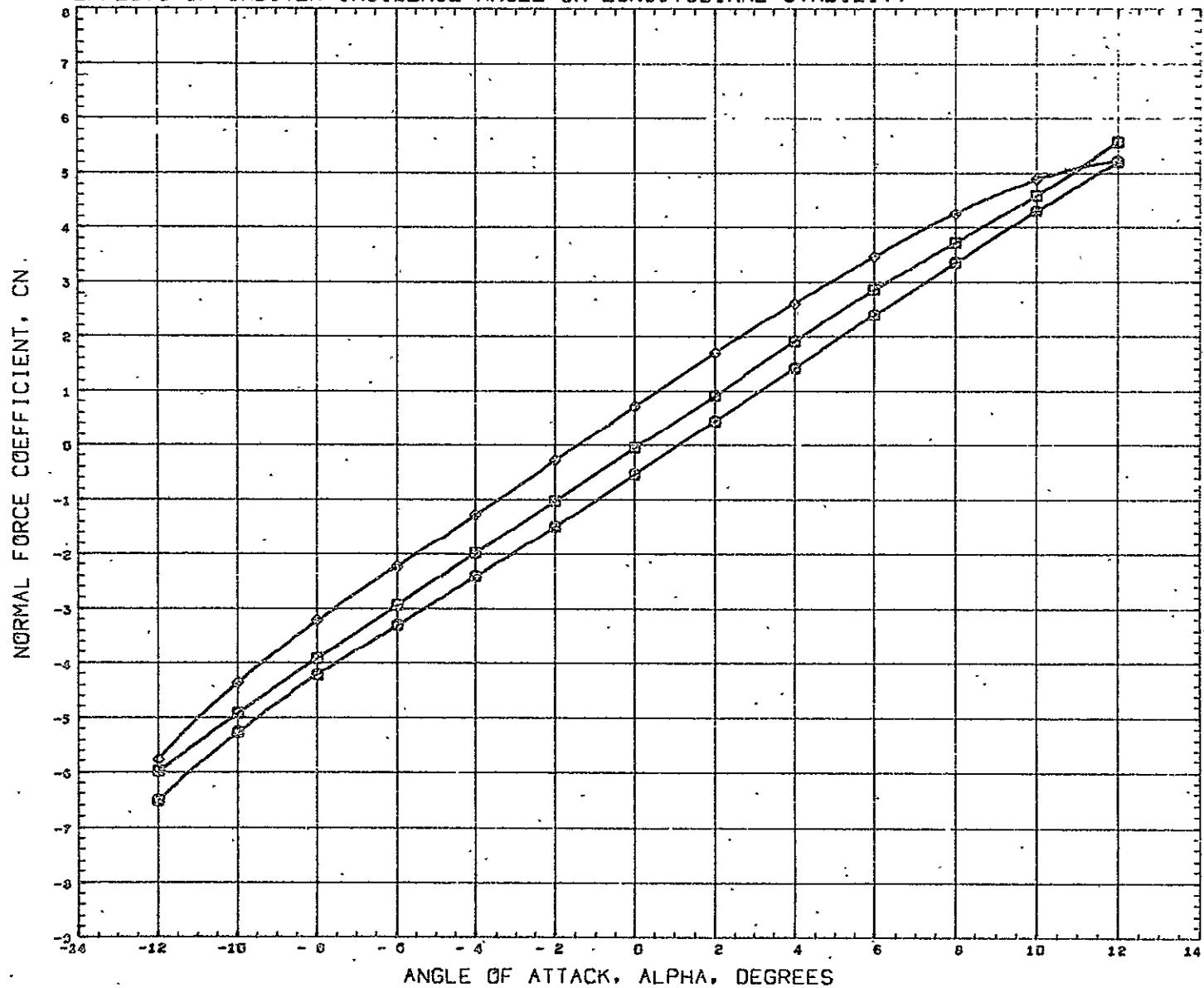
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□	1.000		
◊	4.000		

REFERENCE INFORMATION		
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CFL	1.3330	INCHES
FB	1.3330	INCHES
IRF	5.2640	INCHES
IRP	0.0000	INCHES
IRP	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BF 1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 190

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL ORB1NC

PARAMETRIC VALUES

PARAMETRIC VALUES

REFERENCE INFORMATION

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1.000

4,000

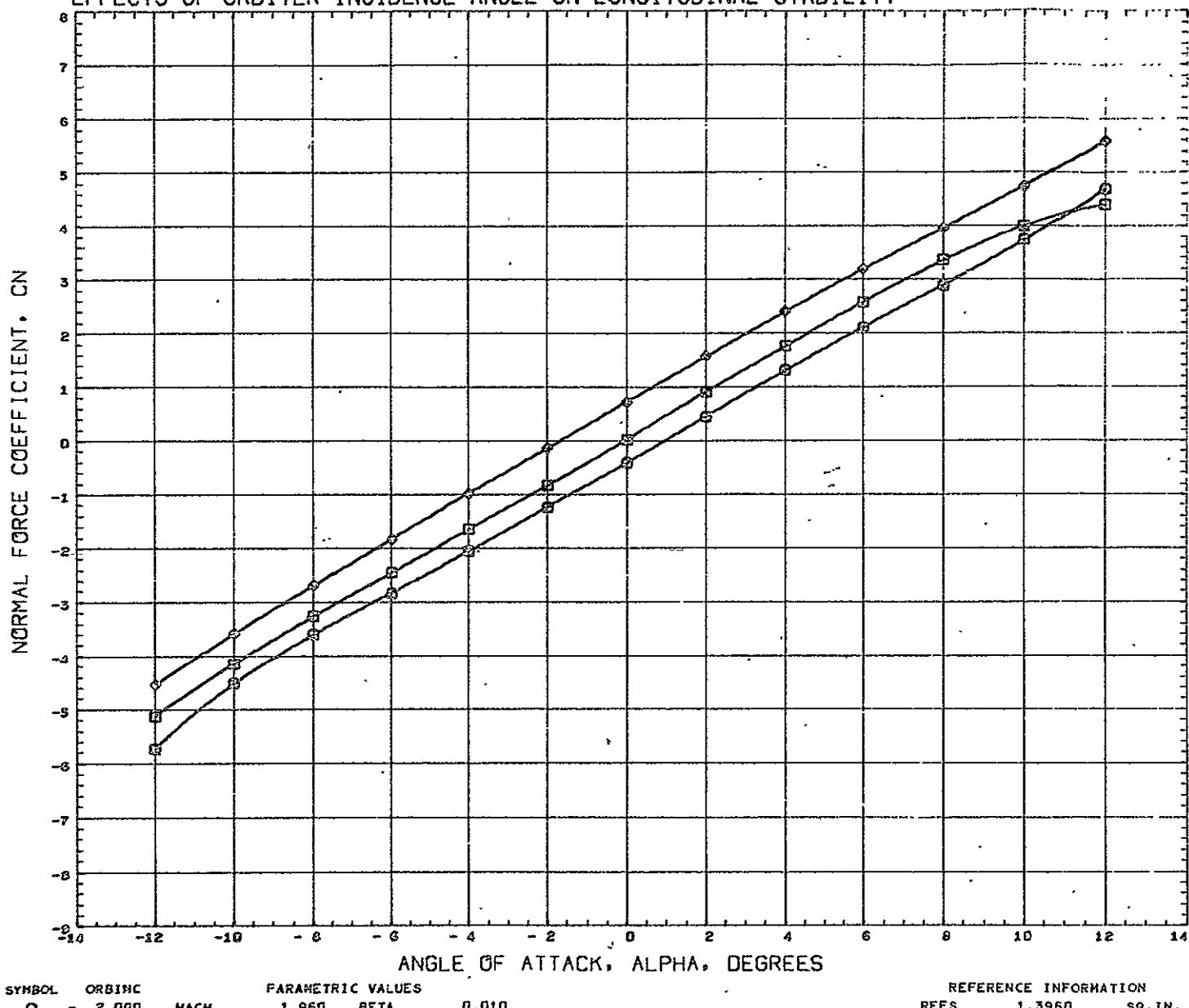
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XNRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

YSSC-172-NP-000000000000

NSR C 4706 AR HCRSRB/S-TELEBOSTER B-15-BSW14ESV17 (X235415) 14 JAN 71

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EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



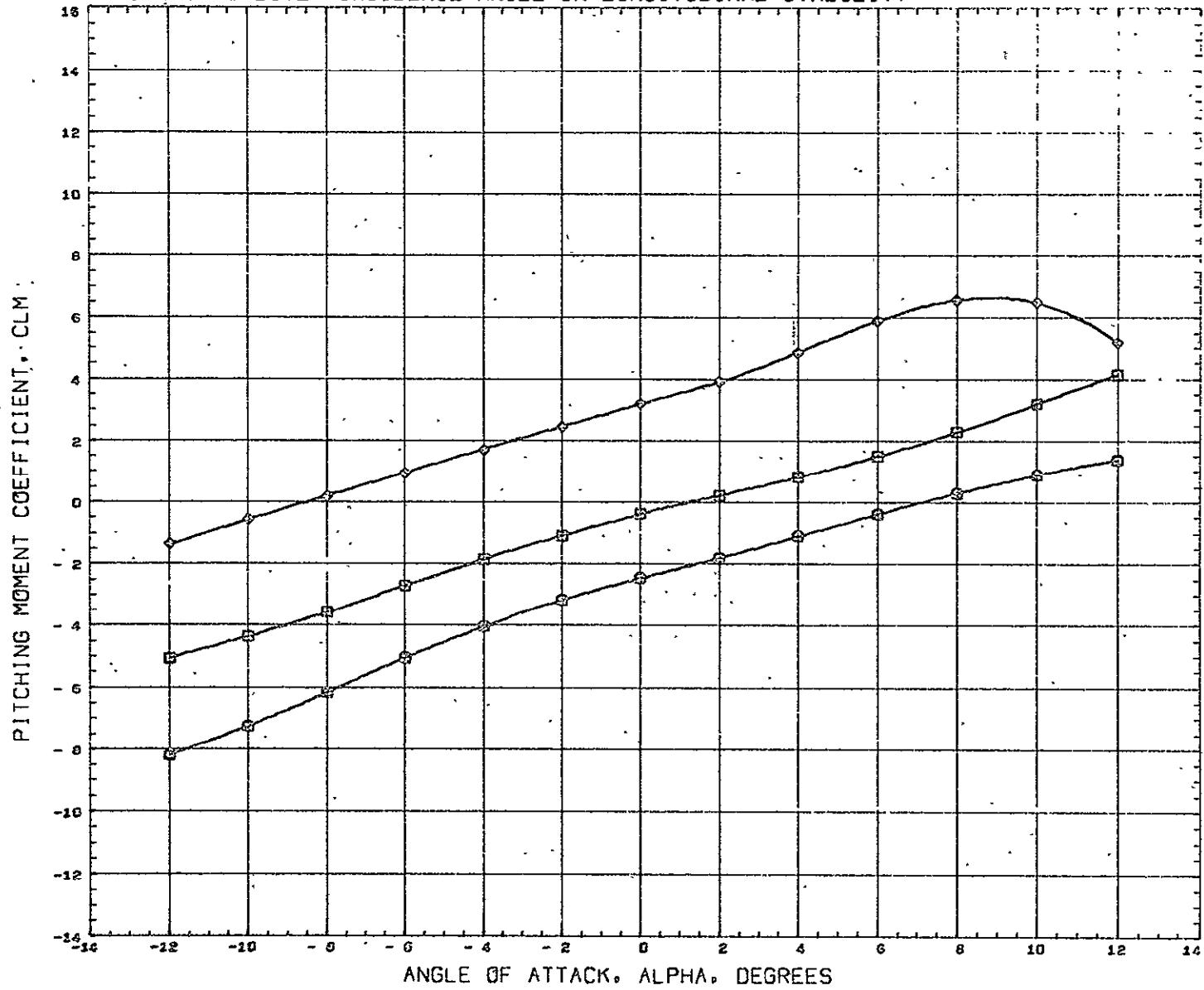
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□	1.000			
◊	4.000			

REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE NMIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 192

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

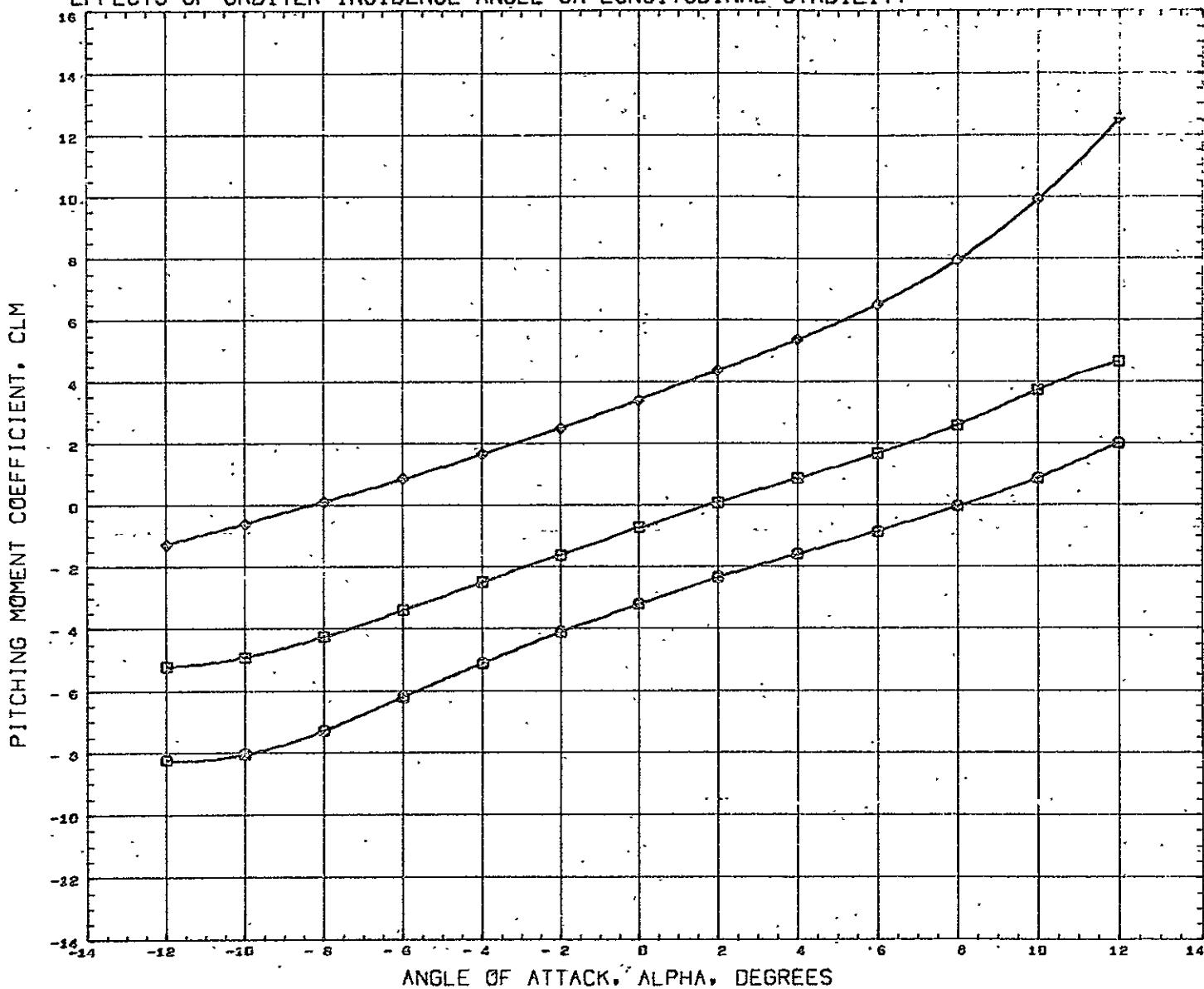


SYMBOL	ORIGIN	PARAMETRIC VALUES		
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REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YMRP	0.0000	INCHES
ZHRP	0.0350	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



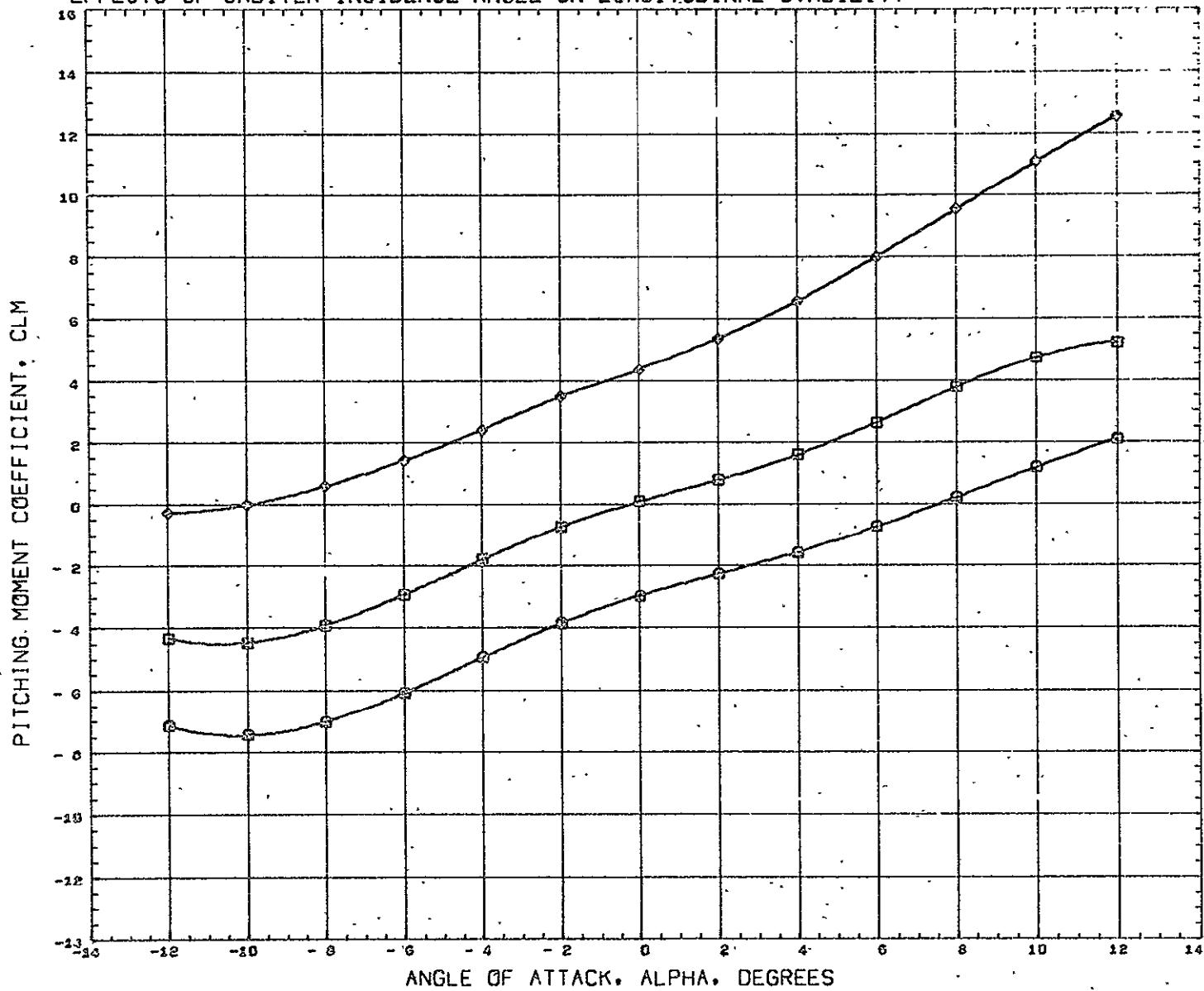
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□	1.000		
◊	4.000		

REFERENCE INFORMATION		
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FFL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RF	0.0000	INCHES
RP	0.0330	INCHES
RALE	0.0034	

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 CA250410 14 JAN 71 PAGE 194

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



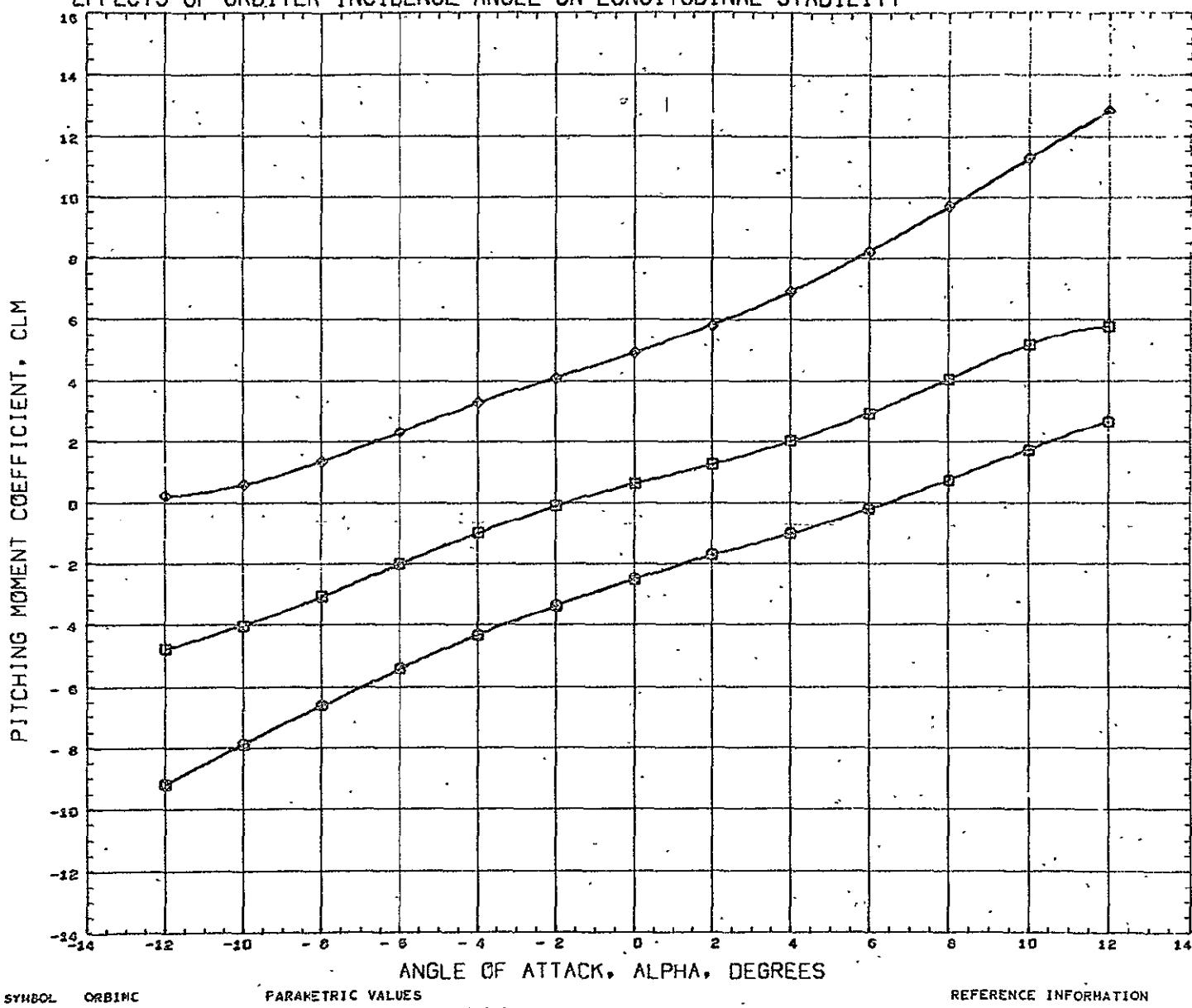
SYMBOL ORBIINC PARAMETRIC VALUES
 □ - 2.000 MACH 1.000 BETA 0.010
 □ 1.000
 ○ - 4.000

REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE MHIF

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (A250410) 14 JAN 71 PAGE 195

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

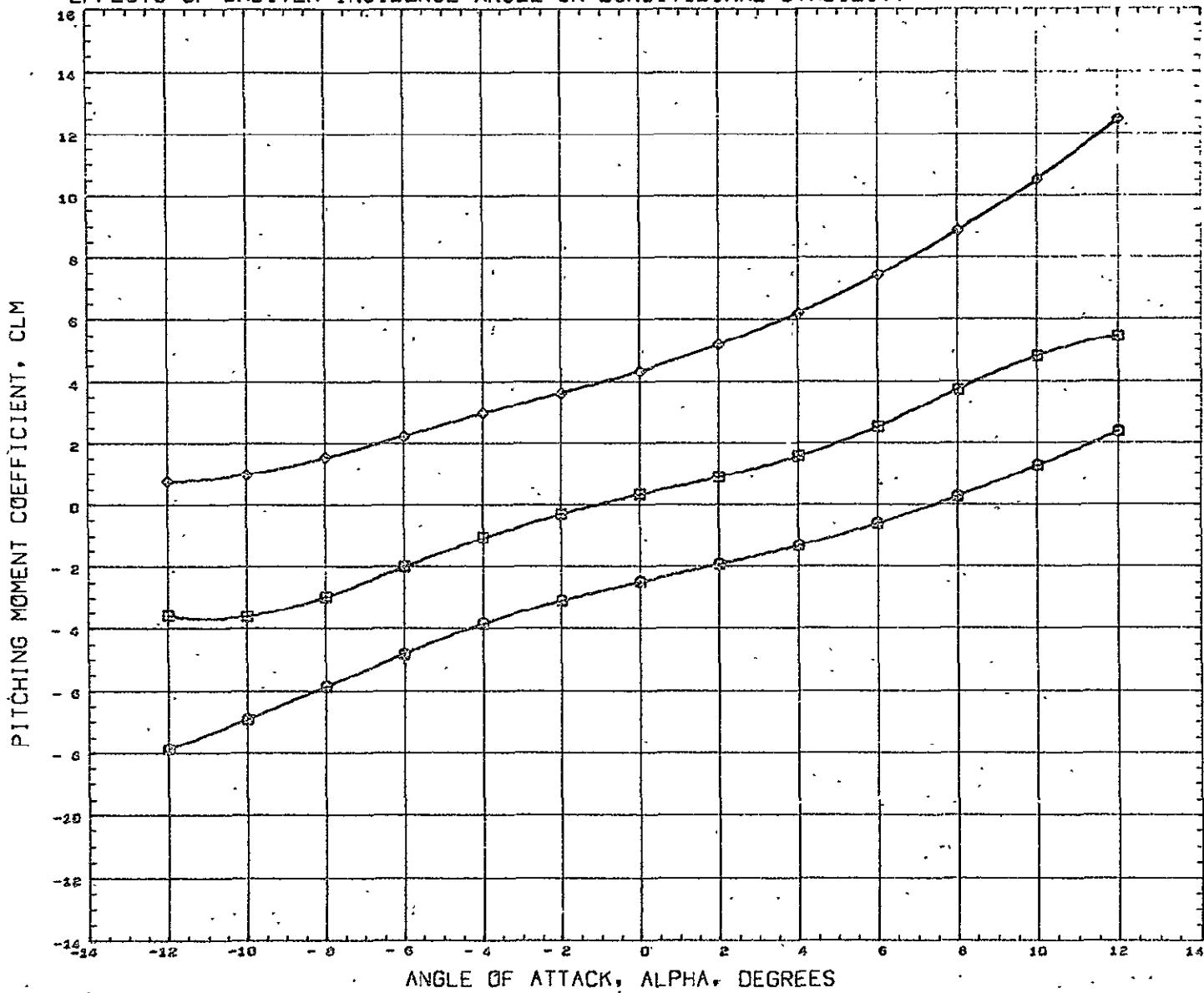


SYMBOL ORBINC PARAMETRIC VALUES
 □ - 2.000 MACH 1.100 BETA 0.010
 □ 1.000
 □ 4.000

DATA MAST. CODE MMIF

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZMRP 0.0330 INCHES
 SCALE 0.0034 INCHES

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



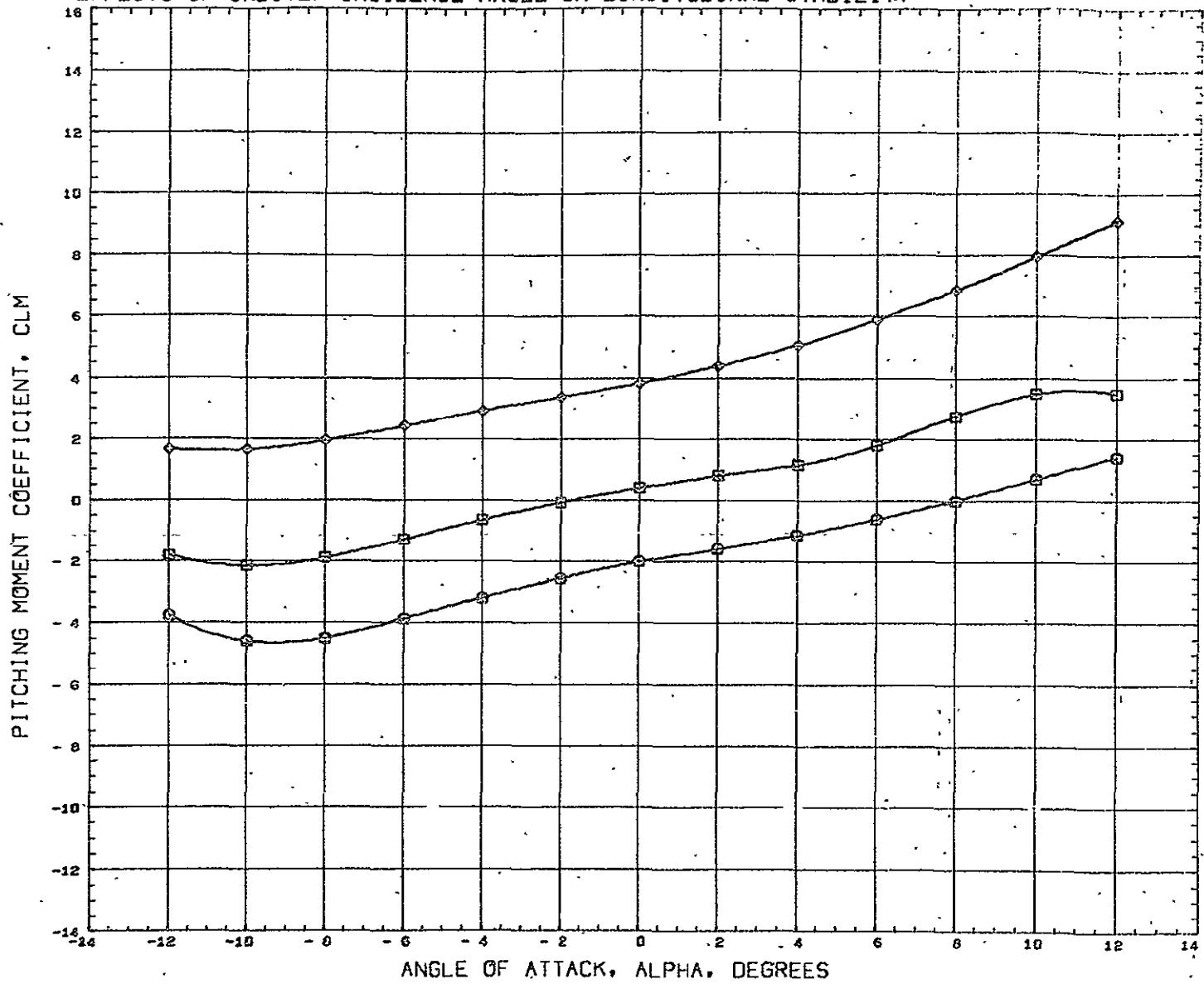
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□	1.800			
◊	4.000			

REFERENCE INFORMATION		
EFS	1.3960	SG. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MHJF

MSFC 476 NR HCR0RB/S-1CB00STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE .197

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



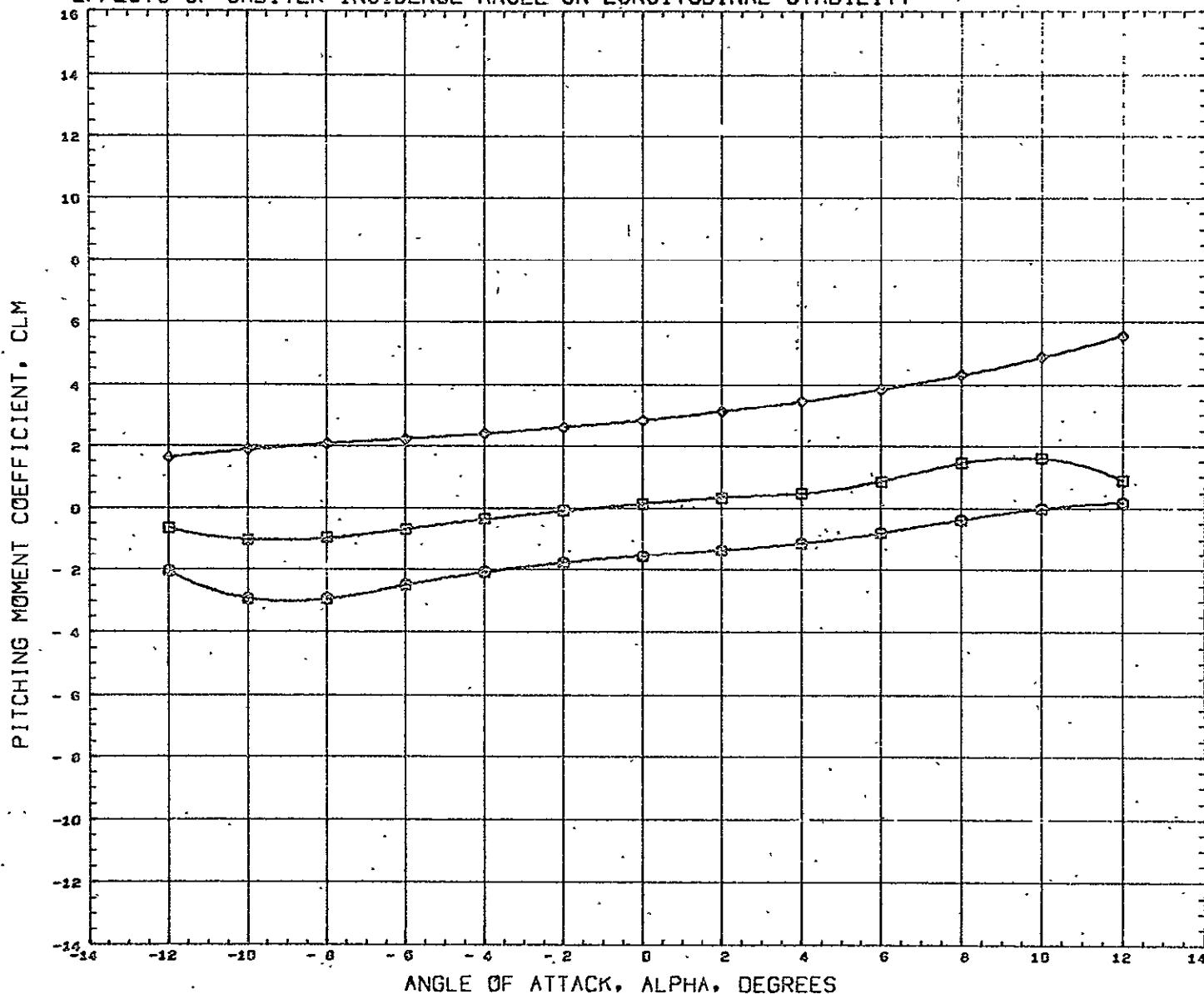
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□	1.000				
◊	4.000				

DATA MIST. CODE HHIF

REFERENCE INFORMATION		
REFS	1.3960	.80 IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB0GSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 198

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC	MACH	PARAMETRIC VALUES
○	2.000		1.960 BETA 0.010
□	1.000		
◊	4.000		

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRP	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

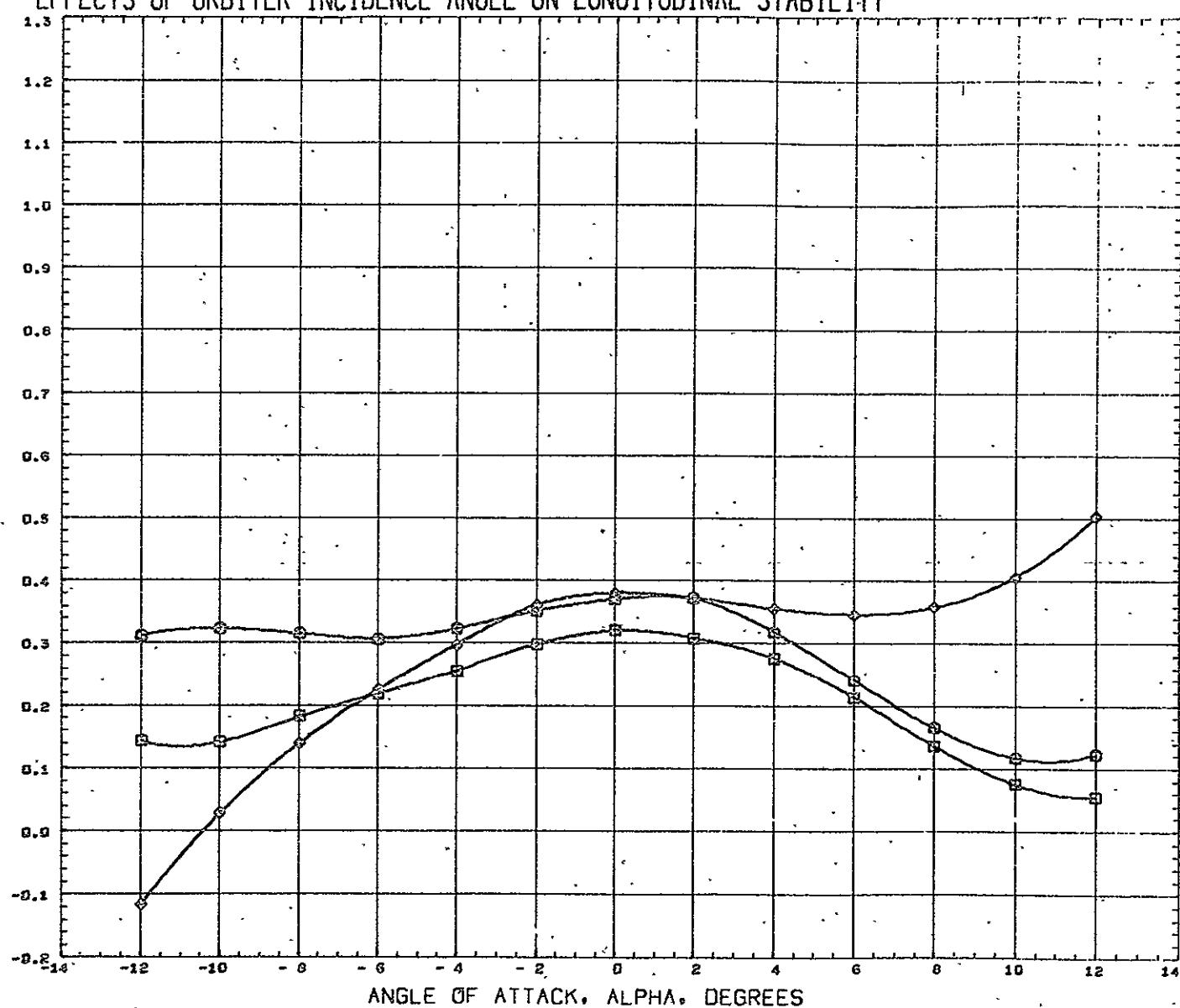
DATA HIST. CODE MNIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 [A25041] 14 JAN 71

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EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



SYMBOL . ORBINC
 ○ - 2.000
 □ 1.000
 ◇ 4.000

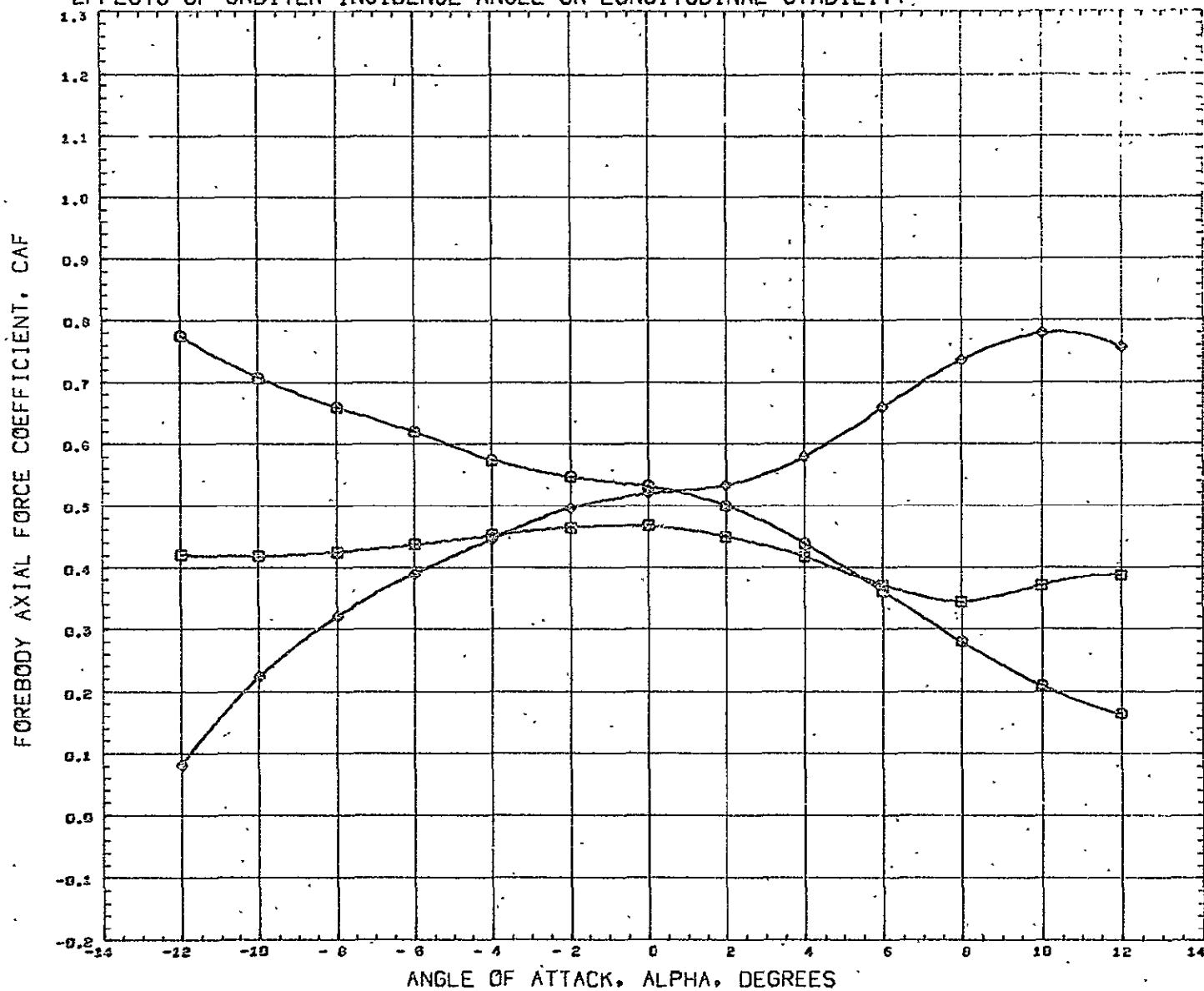
PARAMETRIC VALUES
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REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XMRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZMRF 0.0330 INCHES
 SCALE 0.0034 INCHES

DATA HIST. CODE HHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 200

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY.



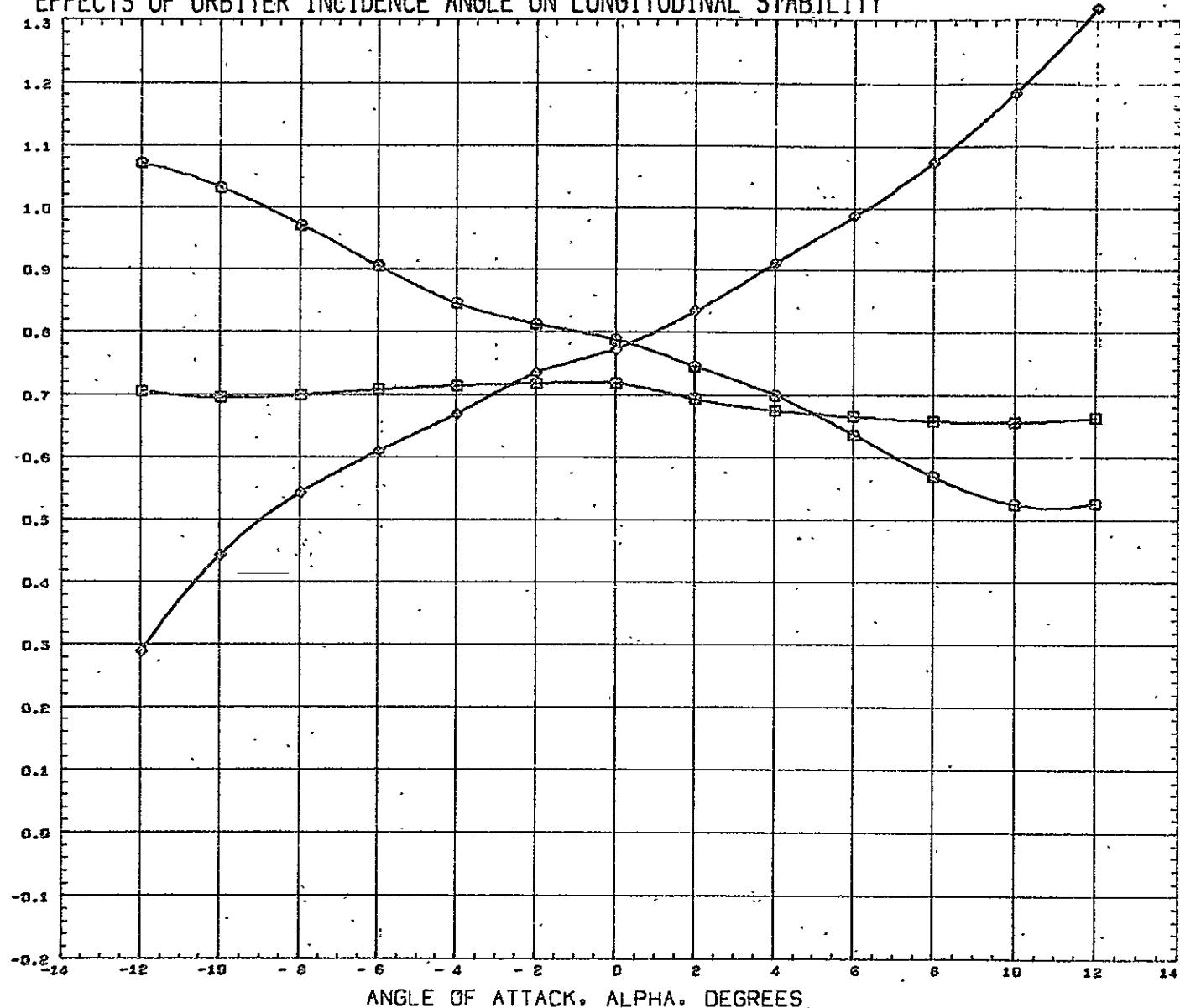
SYMBOL	ORBIAC	PARAMETRIC VALUES		
		MACH	BETA	0.010
○	2.000			
□	1.000			
◊	4.000			

DATA MIST. CODE MNIF

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES.

SYMBOL ORBINC
 ○ - 2.000
 □ 1.000
 ◇ 4.000

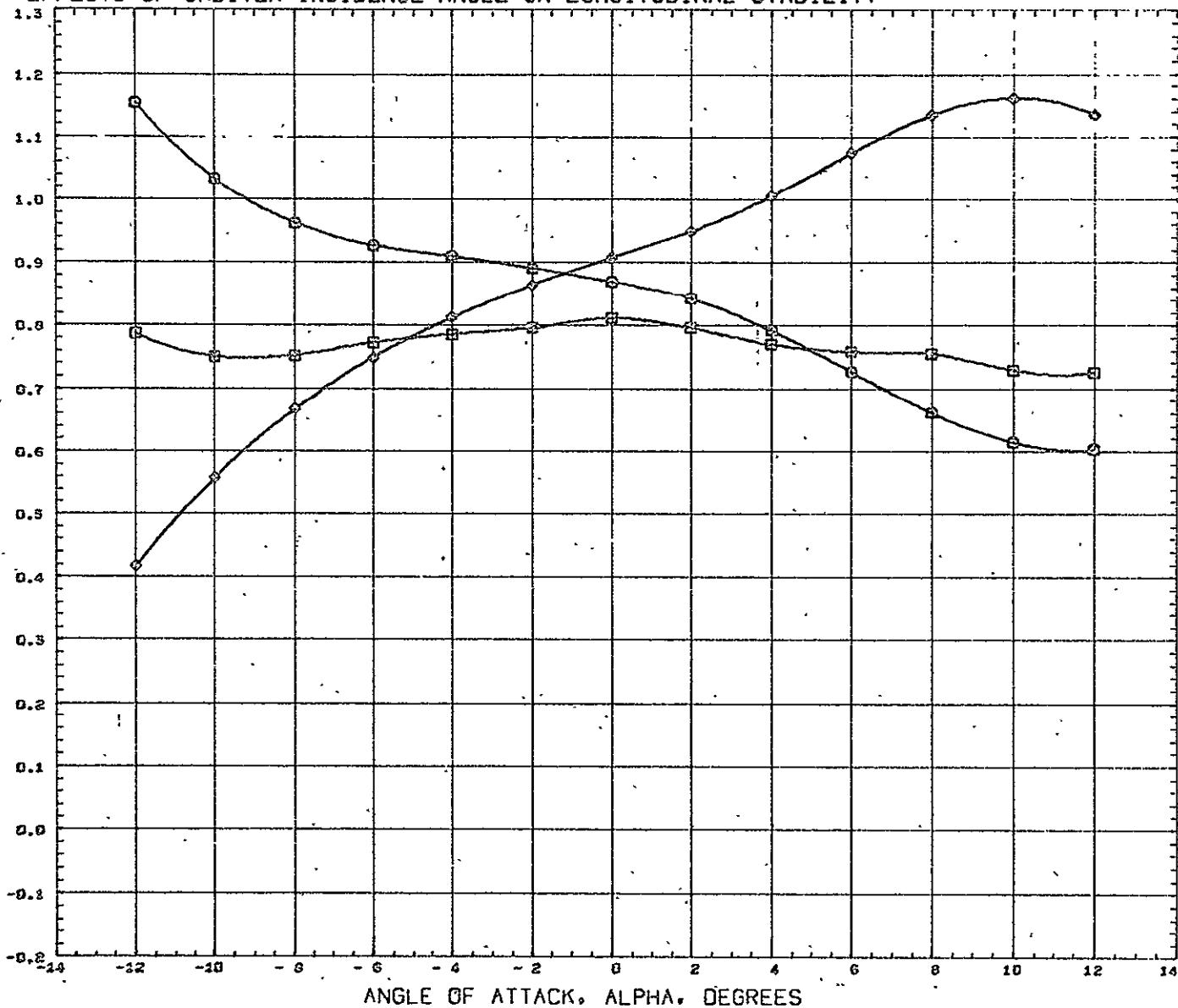
PARAMETRIC VALUES
 MACH 1.000 BETA 0.010

DATA HIST. CODE MNIF

REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0350 INCHES
 SCALE 0.0034

FOREBODY AXIAL FORCE COEFFICIENT, CAF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL ORBINC
 Q - 2.000 HACH
 □ 1.000
 ◊ 4.000

PARAMETRIC VALUES
 1.100 BETA 0.010

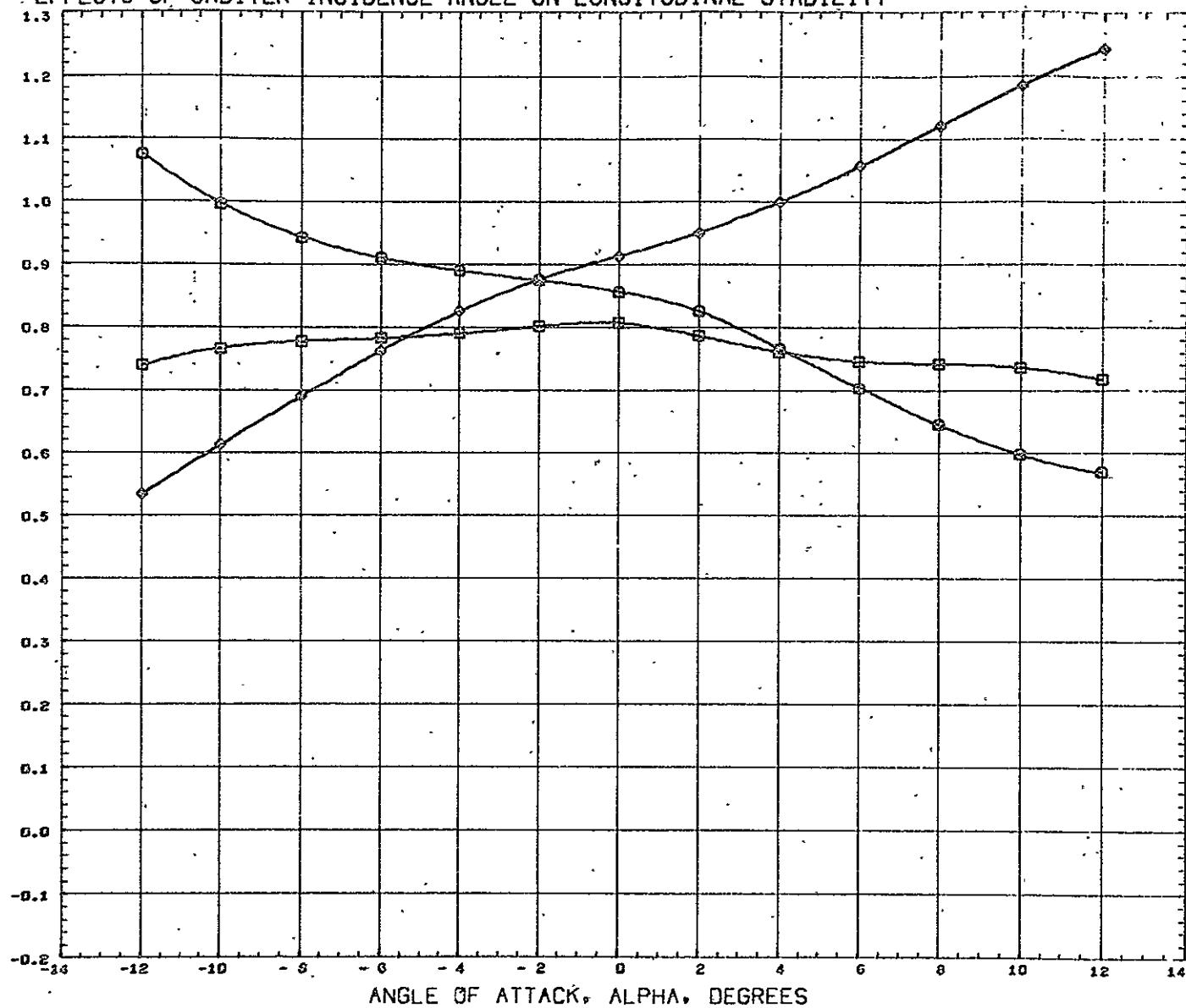
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 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA MAST. CODE NMIF

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 203

FOREBODY AXIAL FORCE COEFFICIENT. CAF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.200	BETA
□	- 2.000			0.010
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SQ. INCHES
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

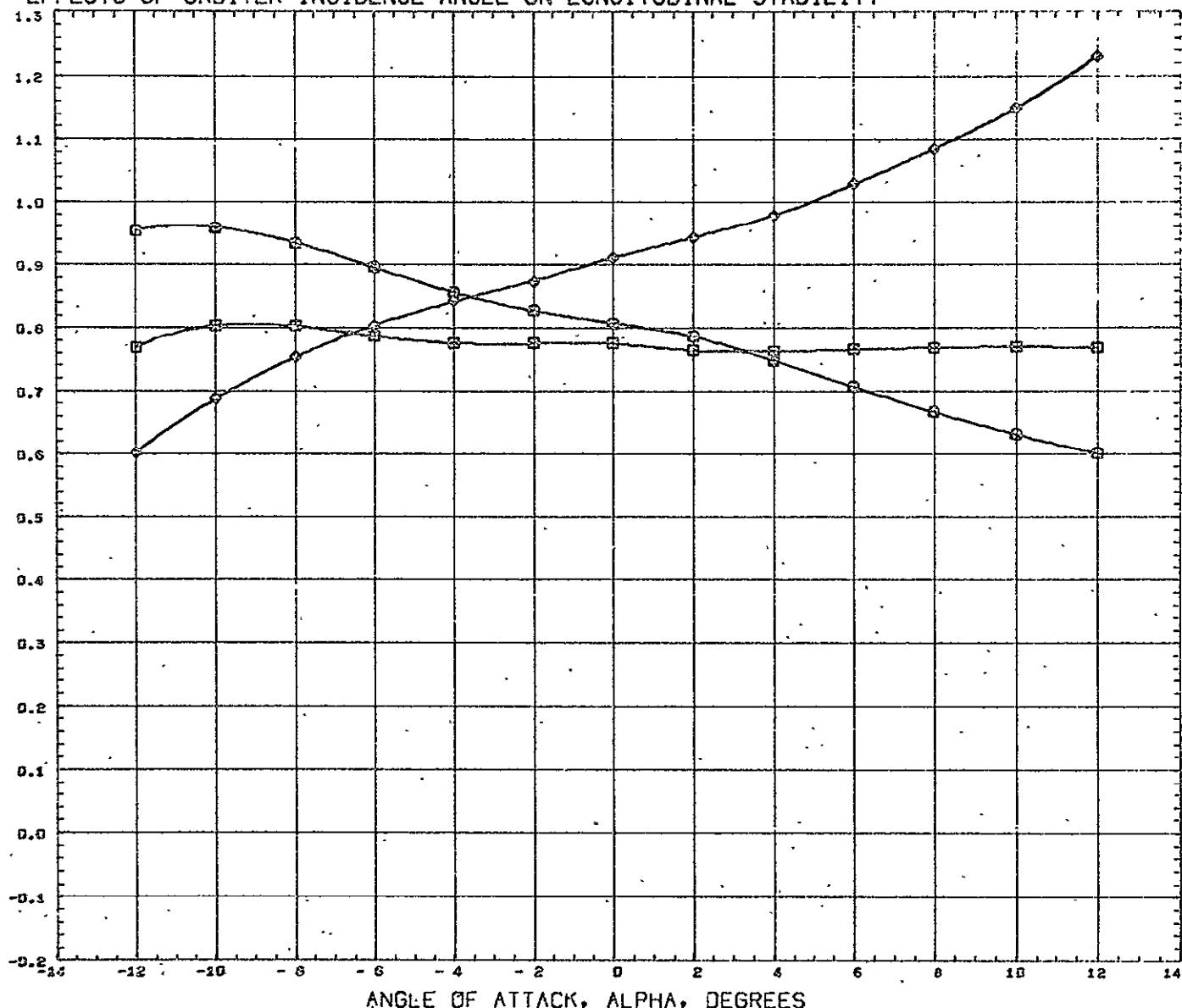
DATA MIST. CODE MHIF

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 (A25041) 14 JAN 71

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EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

FORRE BODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL GRBINC
 ○ 2.000
 □ 1.000
 ◆ 4.000

PARAMETRIC VALUES
 MACH 1.460 BETA 0.010

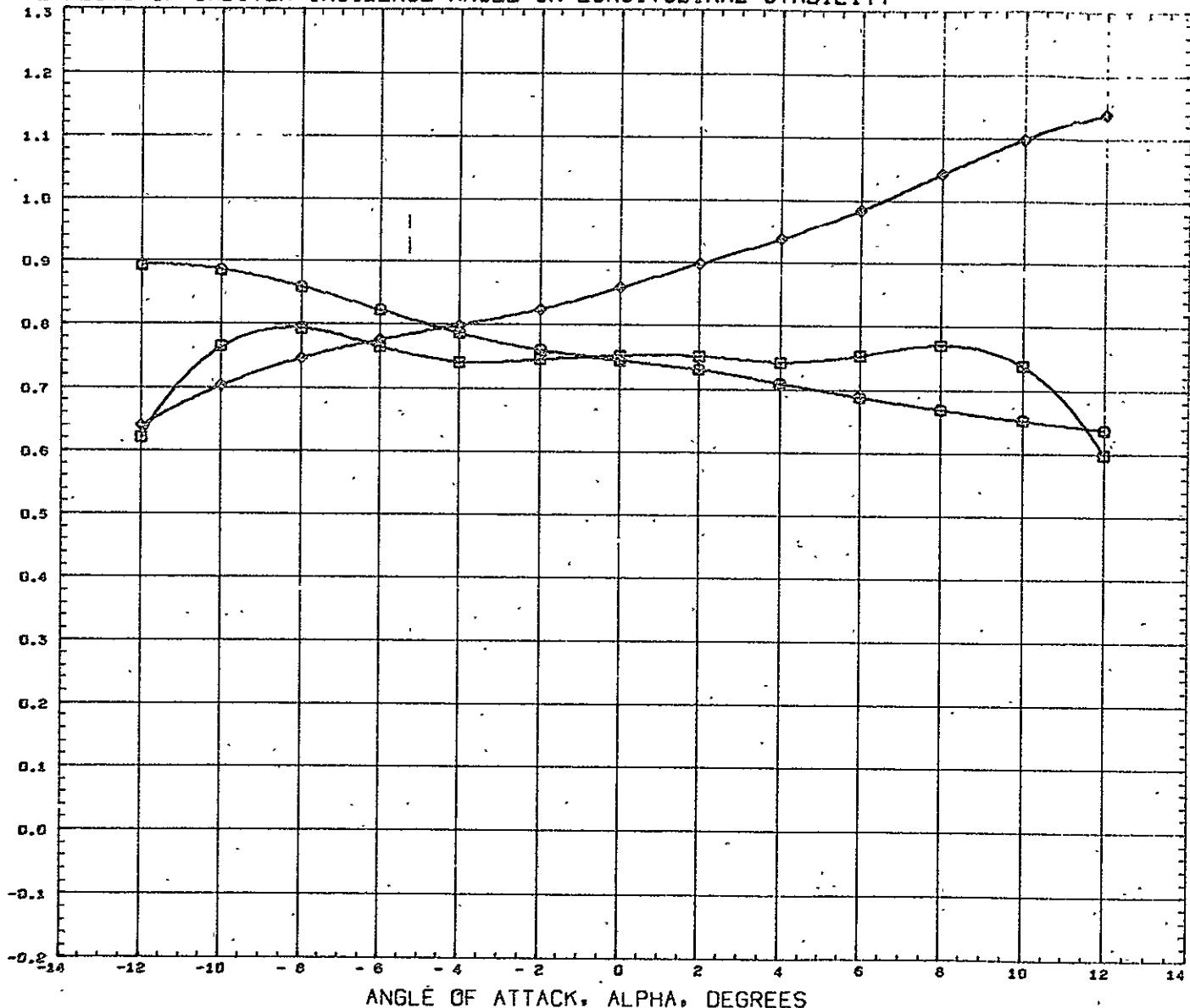
REFERENCE INFORMATION
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 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRP 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZHRP 0.0330 INCHES
 SCALE 0.0034 INCHES

DATA MIST. CODE NMIF

MSFC 476 NR HCRORB/S-1CBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 205

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



SYMBOL ORBINC

PARAMETRIC VALUES

— 2.000 MACH 1.960 BETA 0.010
□ 1.000
◊ 0.010
△ 4.000

REFERENCE INFORMATION

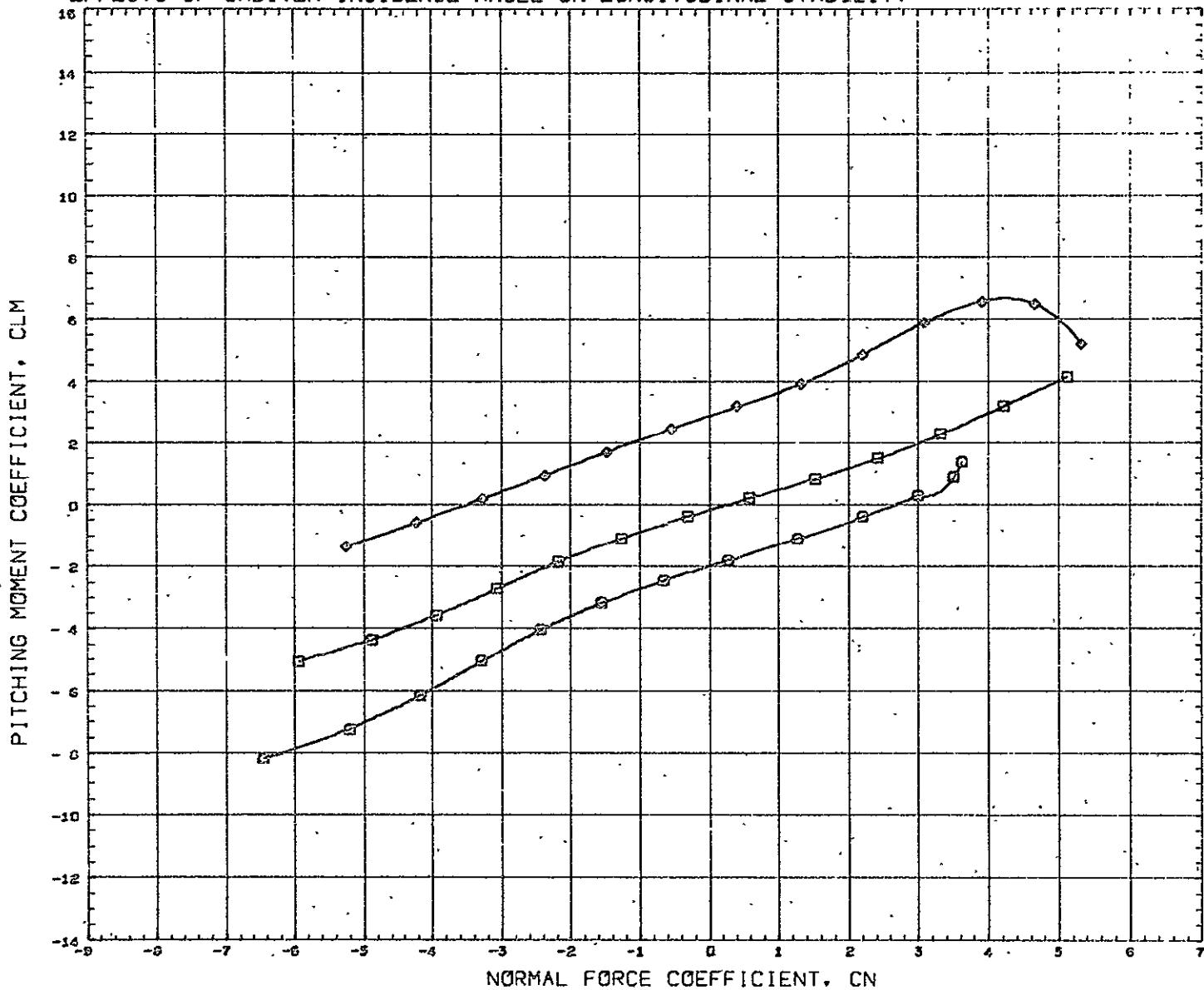
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REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71

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EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL ORBINC PARAMETRIC VALUES

PARAMETRIC VALUES

REFERENCE INFORMATION

Q - 2.000

MACH

9.9

1.000

4

◆ 4.000

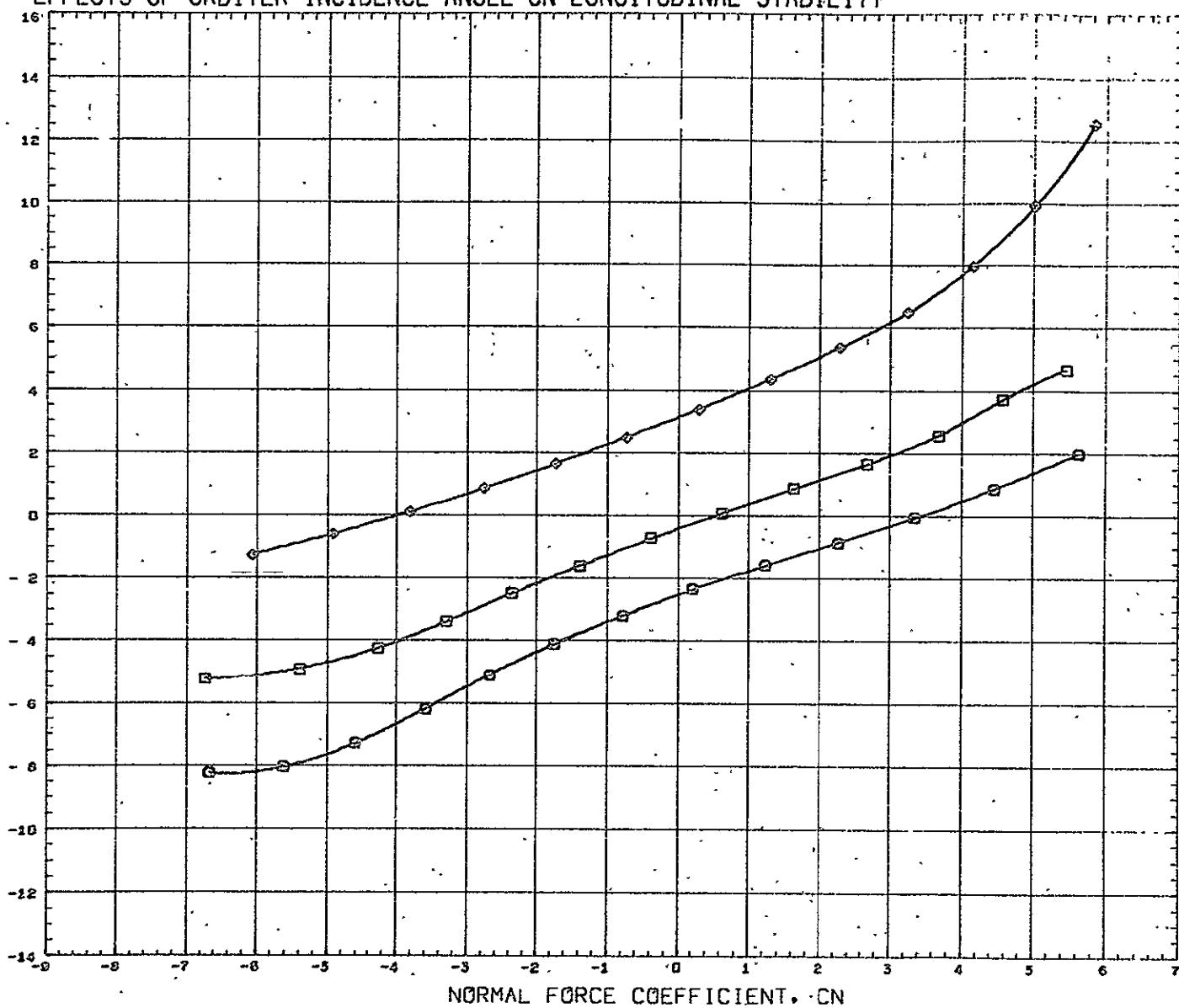
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REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

MSFC 476 NR HCR0RB/S-ICBOOSTER BF1S+B5W14E3V17 CA250410 14 JAN 71 PAGE 207

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



NORMAL FORCE COEFFICIENT, CN

SYMBOL ORBINC
 ○ - 2.000
 □ 1.000
 ◇ 0.900
 ▲ 0.010

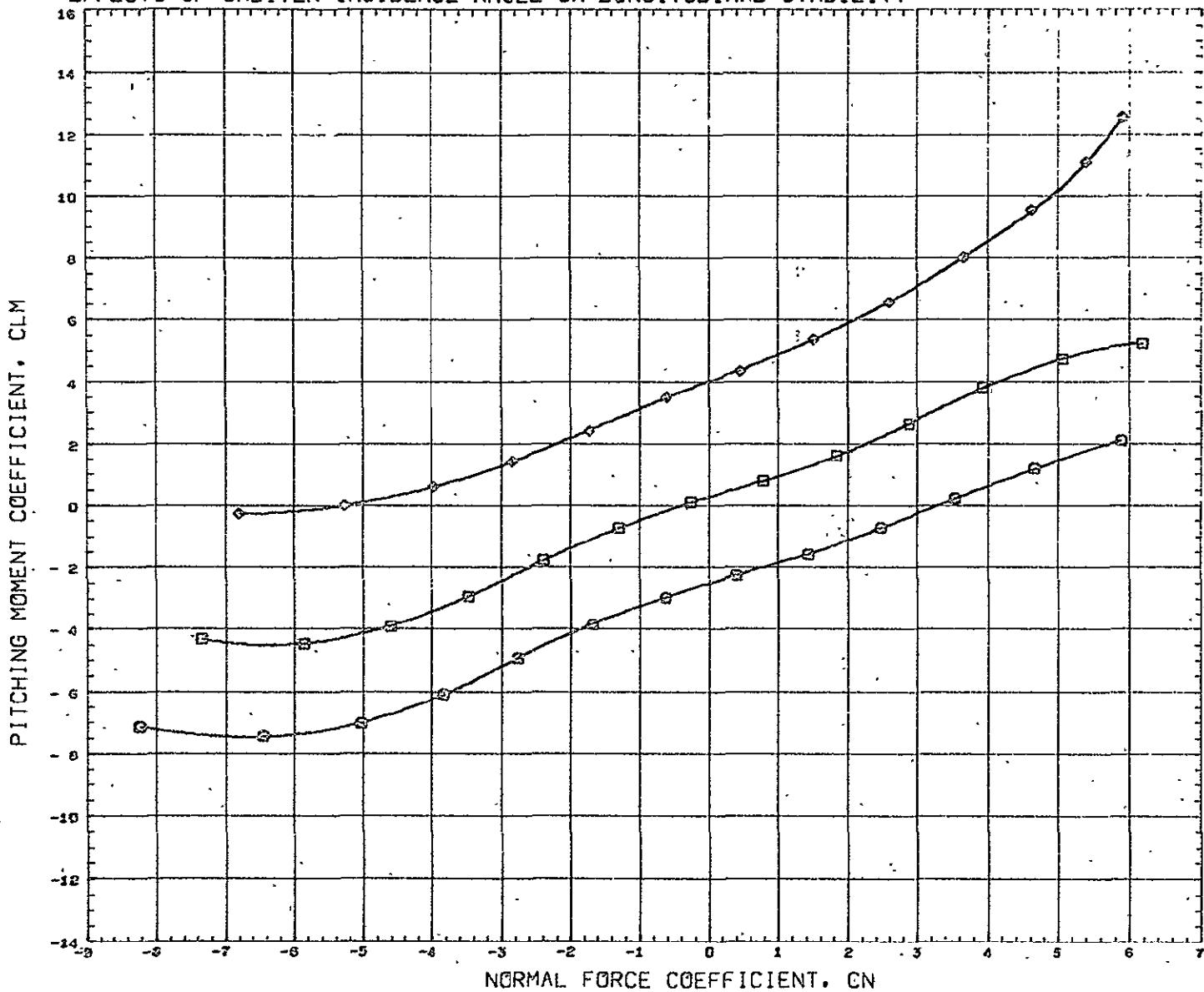
PARAMETRIC VALUES
 HACH 0.900 BETA 0.010

DATA MIST. CODE NMIF

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 208

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

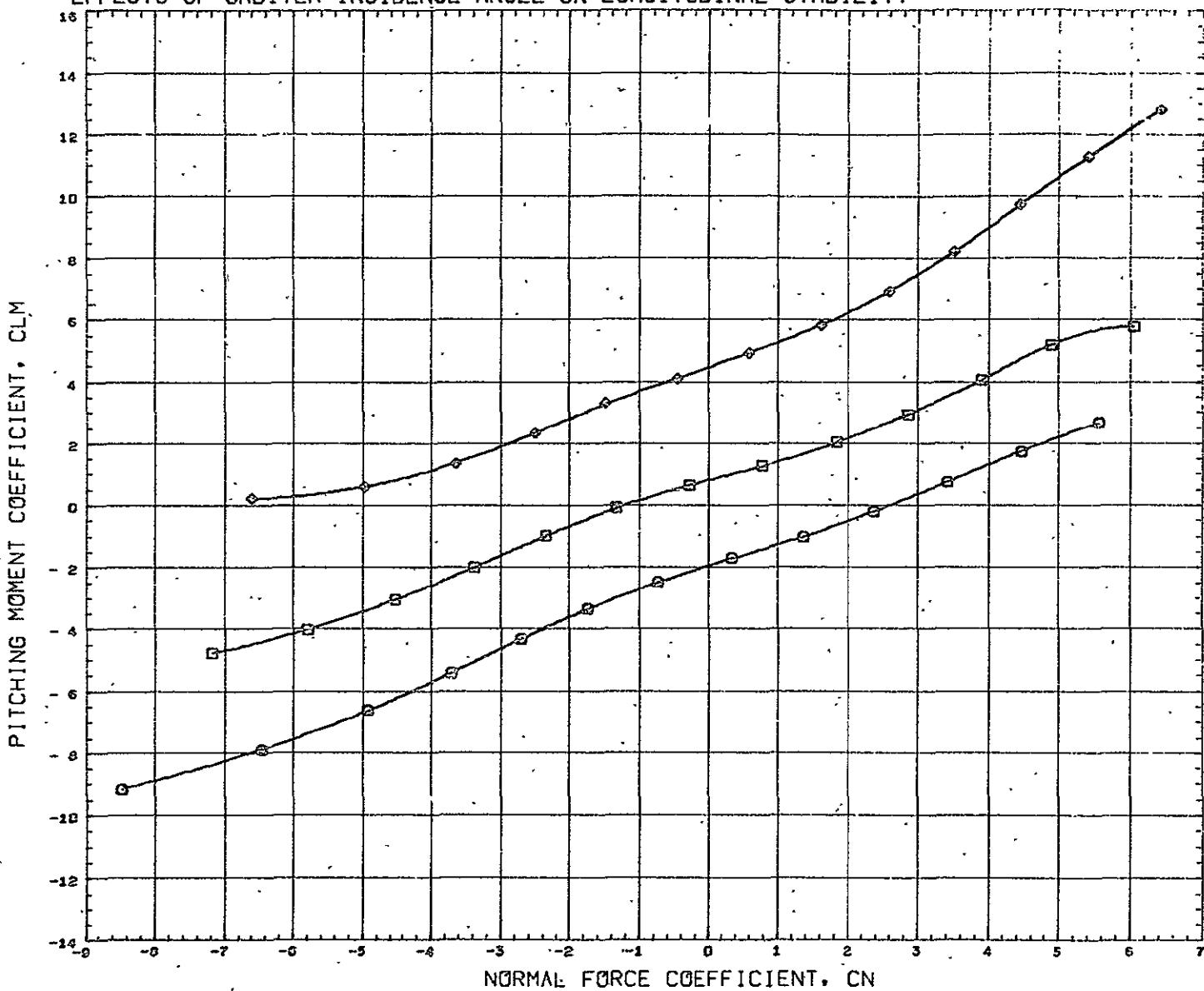


SYMBOL CRSINC MACH PARAMETRIC VALUES
 ○ - 2.000 1.000 1.000 BETA 0.010
 □ - 1.000
 ◇ - 4.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE MHIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



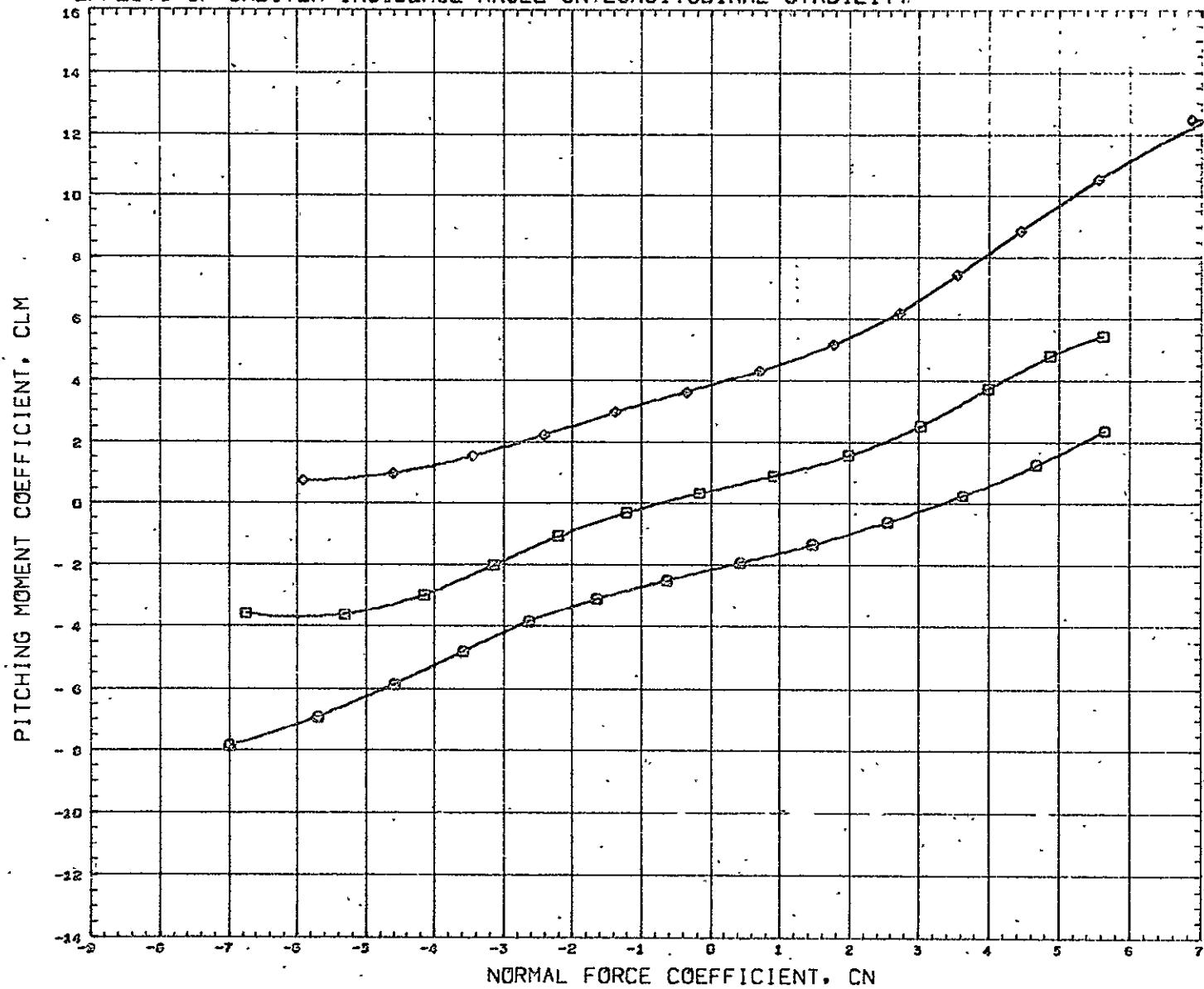
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<input type="checkbox"/>	1,000			
<input type="checkbox"/>	4,000			

REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0030	

DATA MIST. CODE MNIF

MSFC 476 NR HCR0RB/S-ICB000STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 210

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY.

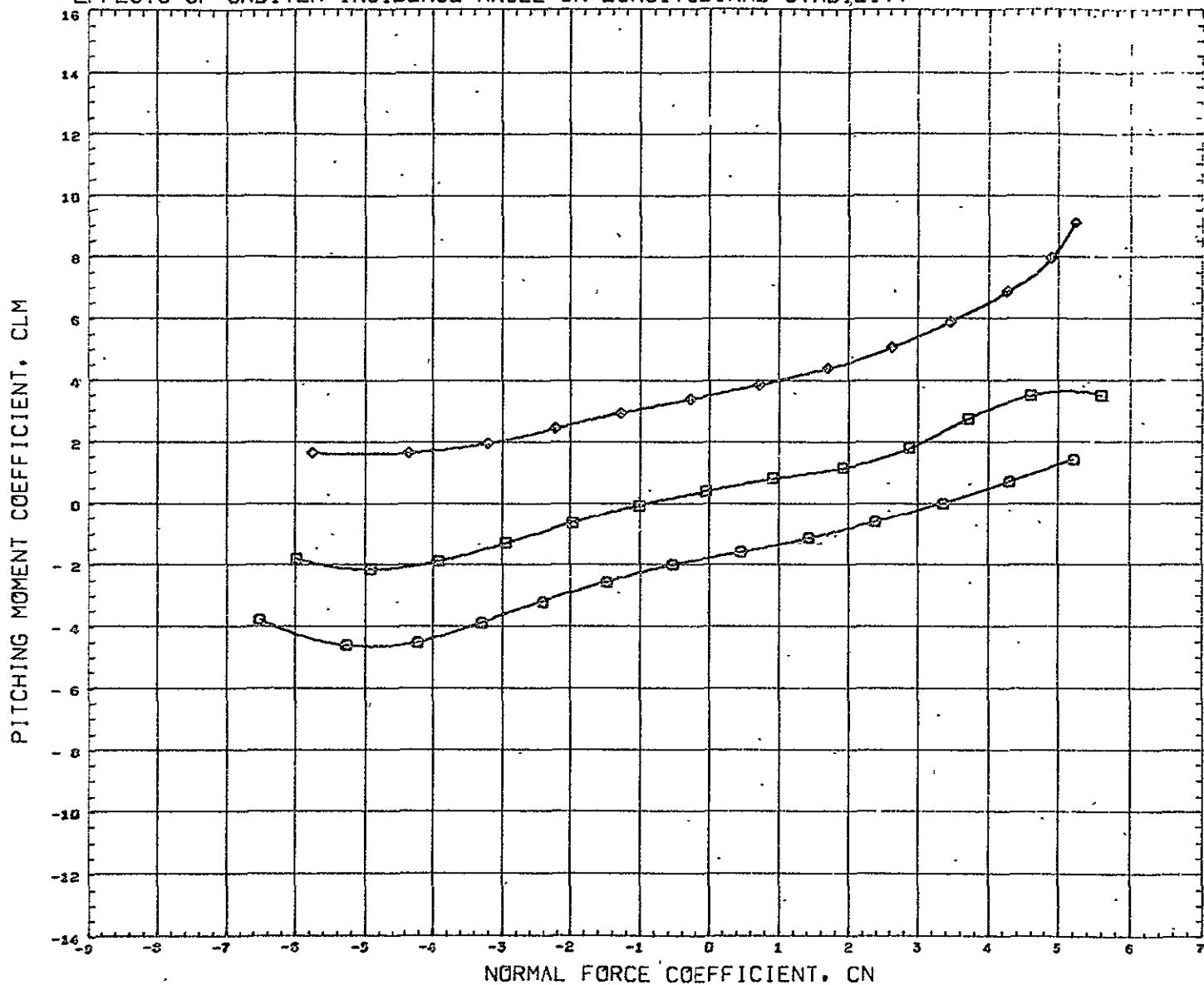


SYMBOL	ORIGIN	PARAMETRIC VALUES
□	- 2.000	HACH 1.200 BETA
□	1.000	
◊	4.000	

REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.460	BETA
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□	1,000			
◊	4,000			

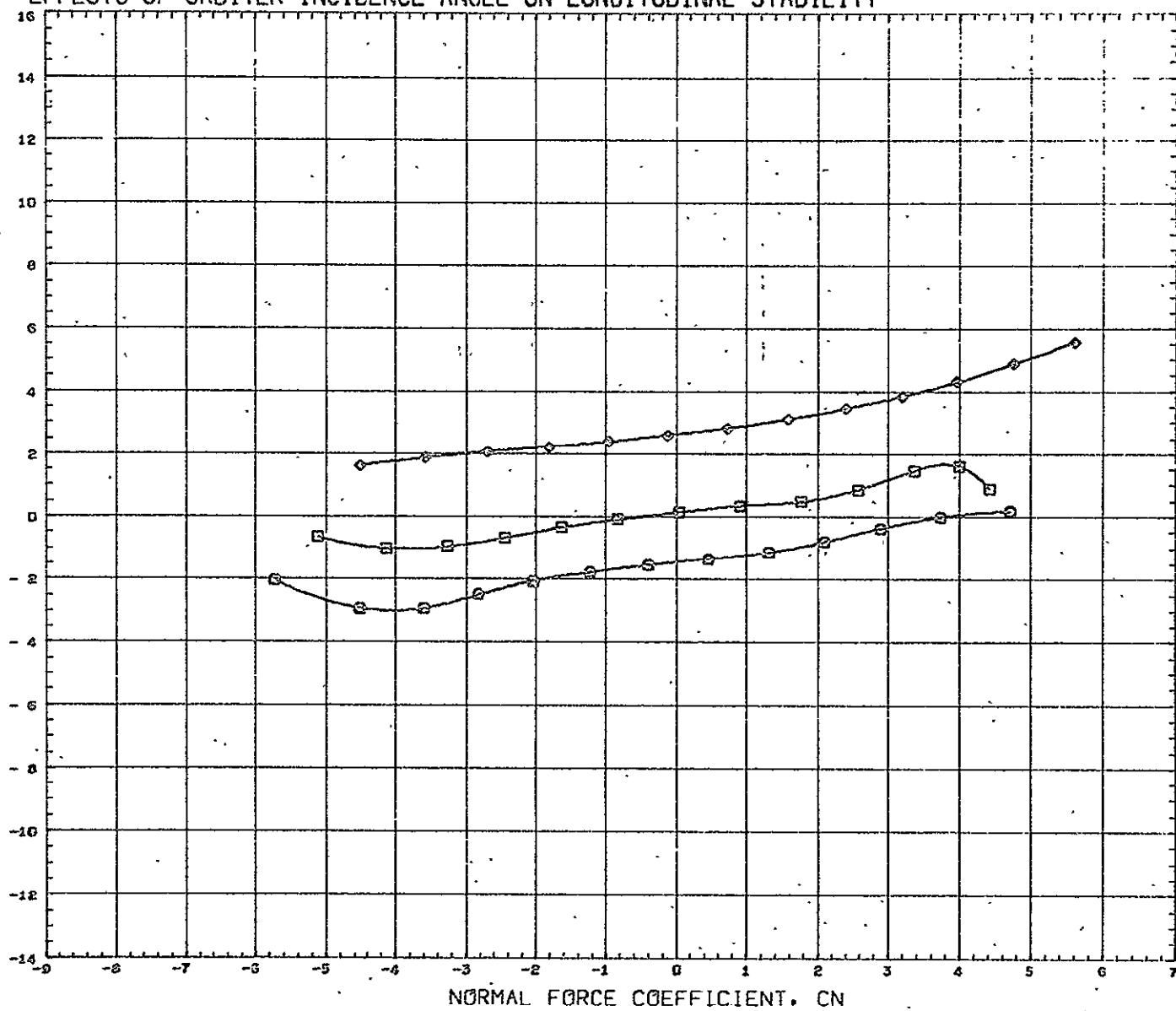
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REFERENCE INFORMATION		
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REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YHPR	0.0000	INCHES
ZMFR	0.0330	INCHES
SCALE	0.0034	

MSEC 476 NR HCR0RB/S-1CB000STER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 212

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, GLM



SYMBOL ORBINC

HACH

PARAMETRIC VALUES

1.960

BETA

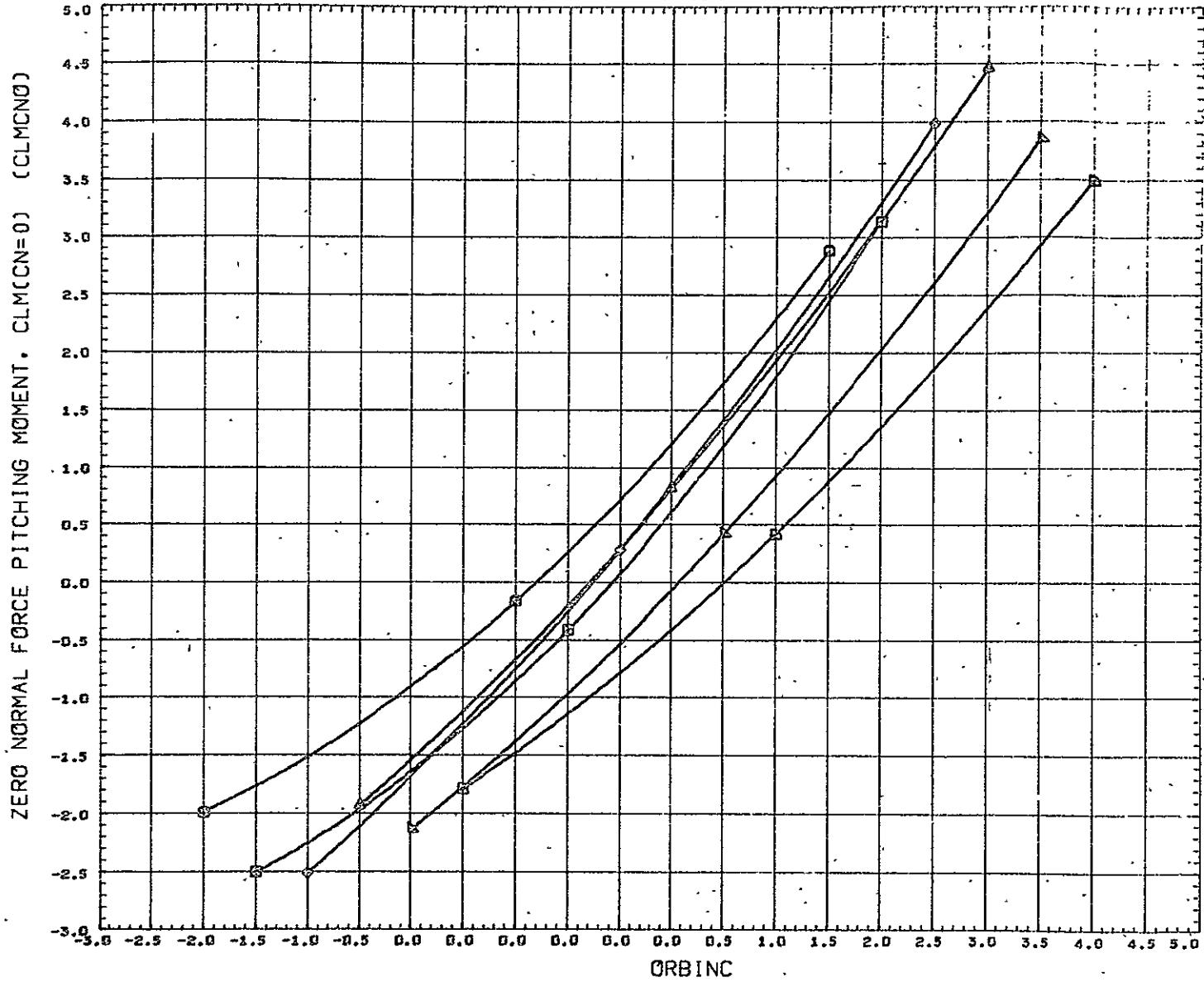
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REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

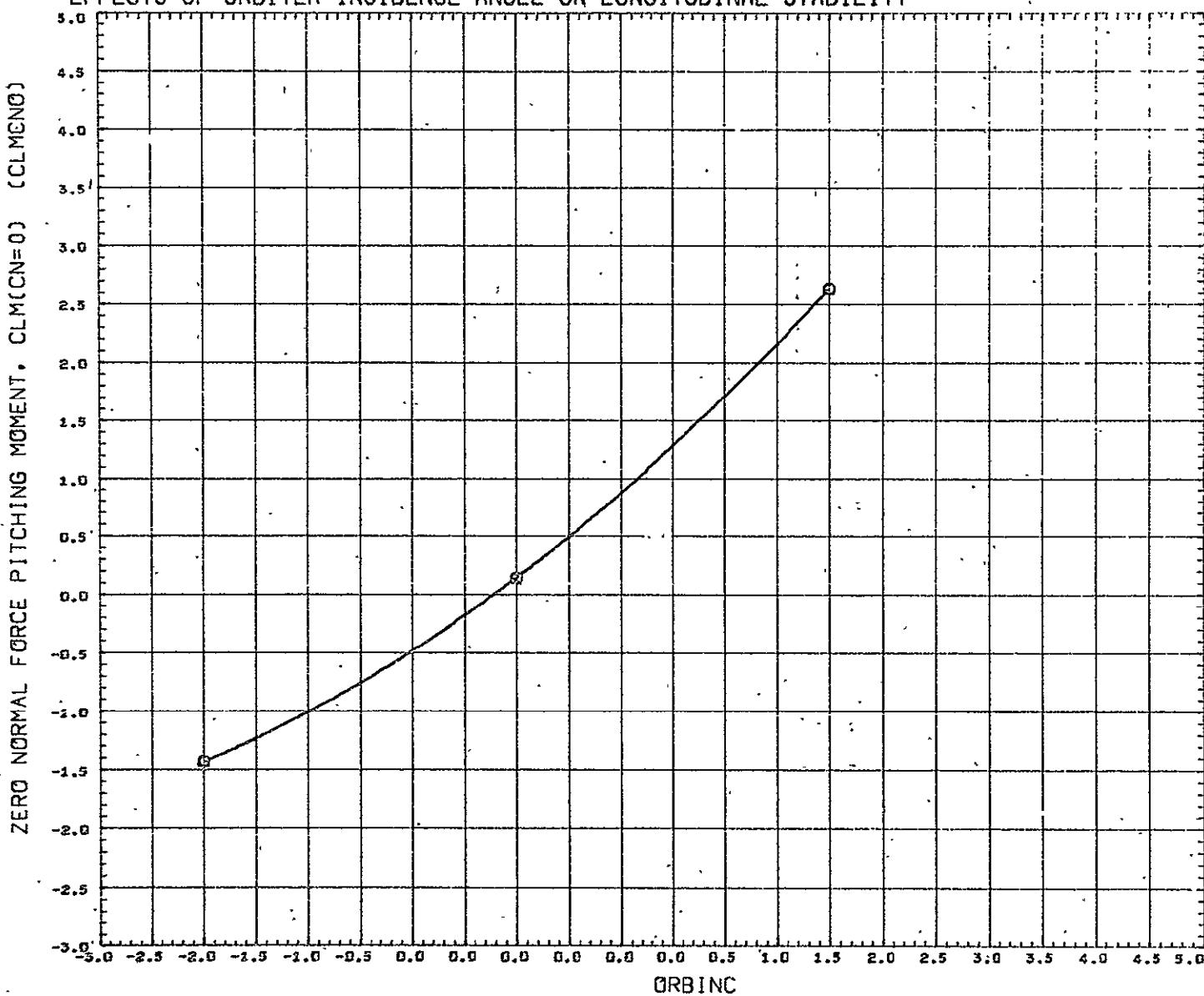


SYMBOL	MACH	PARAMETRIC VALUES	
		BETA	0.010
□	0.600		
□	0.900		
◊	1.000		
△	1.100		
▽	1.200		
▷	1.460	DATA MIST. CODE	MMIF

REFERENCE INFORMATION		
SFS	1.3960	SQ. IN.
SFL	1.3330	INCHES
IFB	1.3330	INCHES
IRF	5.2640	INCHES
IRP	0.0000	INCHES
IRF	0.0330	INCHES
CALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BF1S+B5W14E3V17 CA250410 14 JAN 71 PAGE 214

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

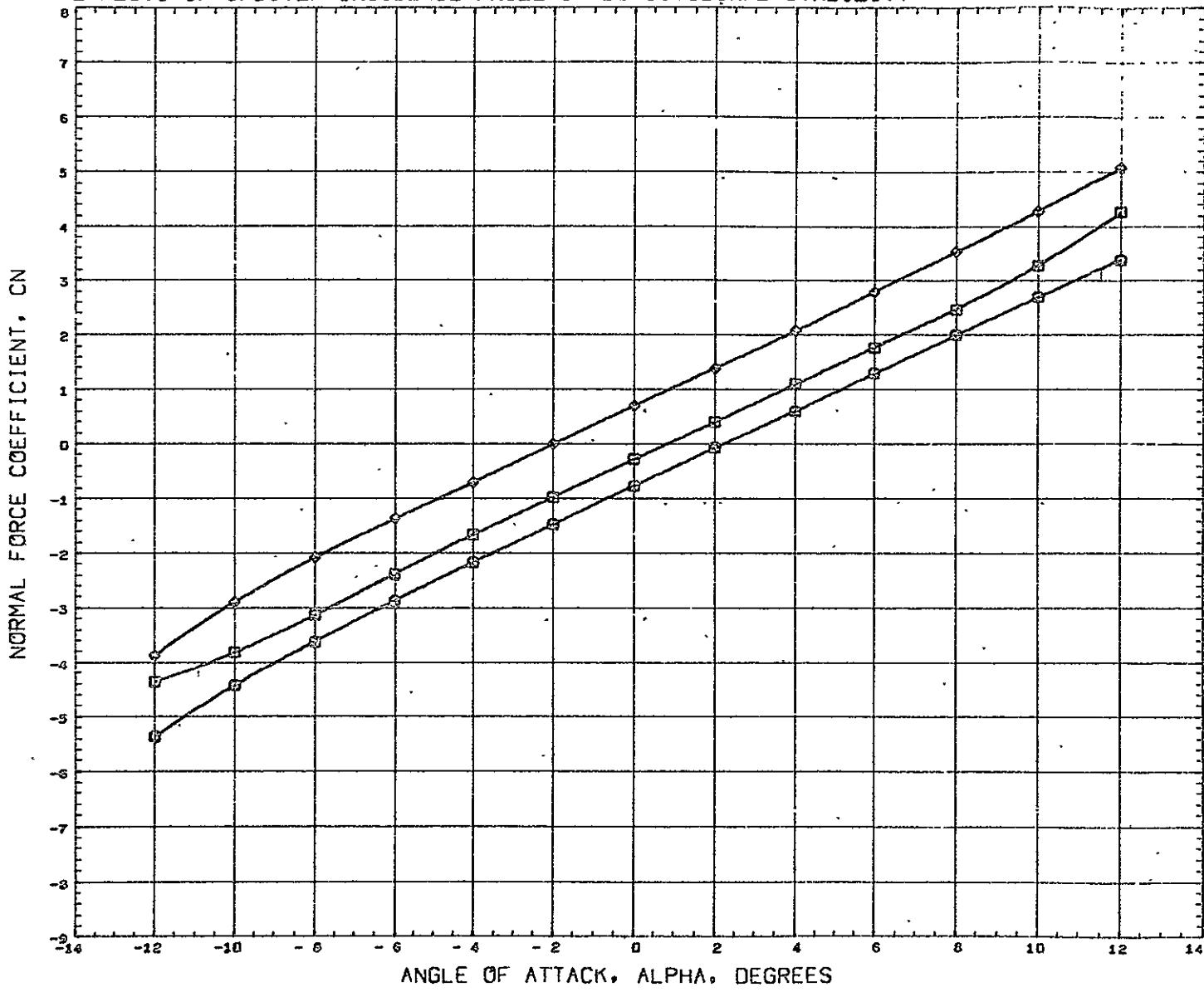


SYMBOL MACH BETA PARAMETRIC VALUES
 \odot 1.960 BETA 0.010

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YHRF	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NMIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



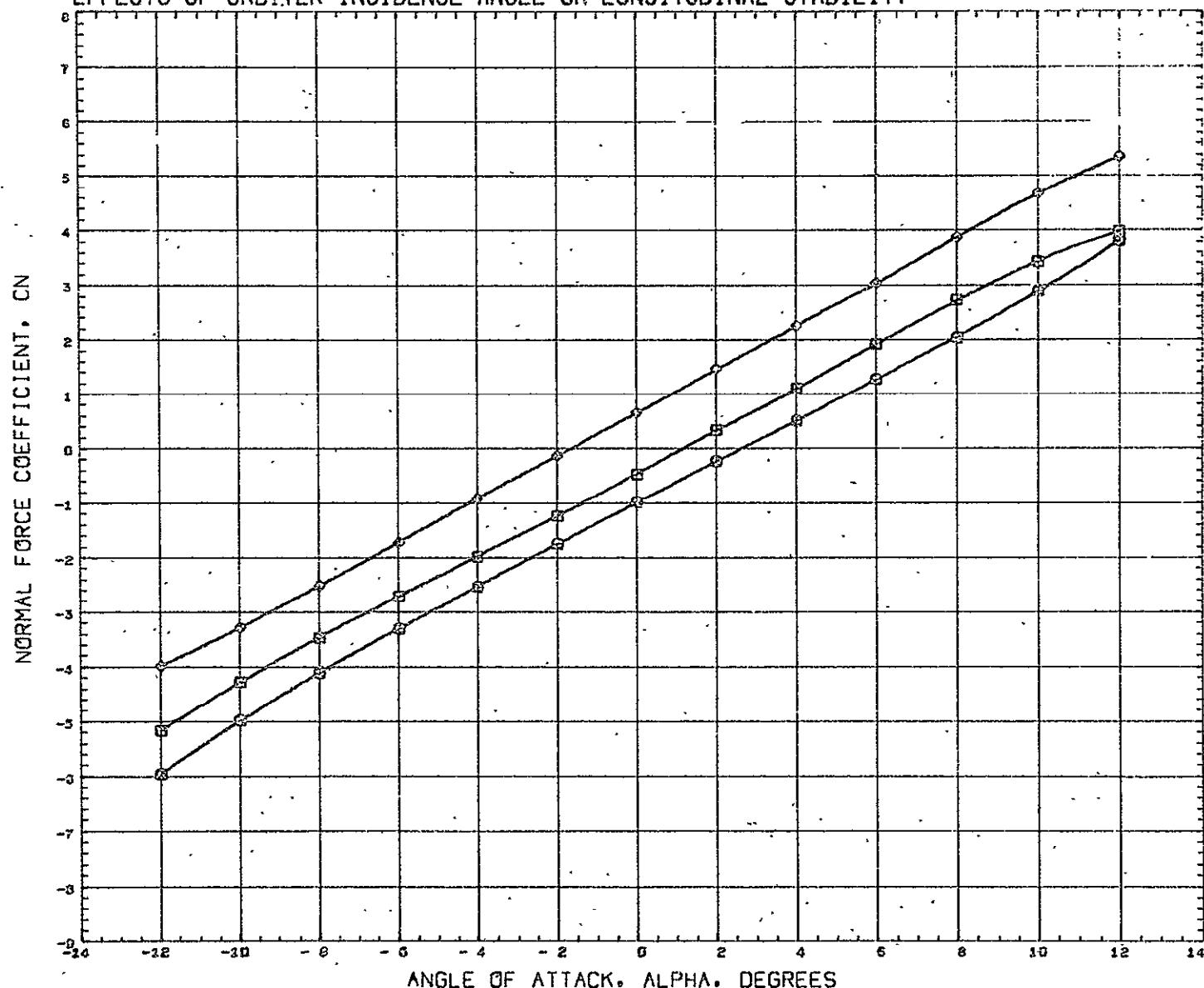
SYMBOL	ORGINC	PARAMETRIC VALUES		
		NACH	G.600	BETA
○	- 2.000		0.600	0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZNRP	0.0330	INCHES
SCALE	G.0034	

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-1CB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 216

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



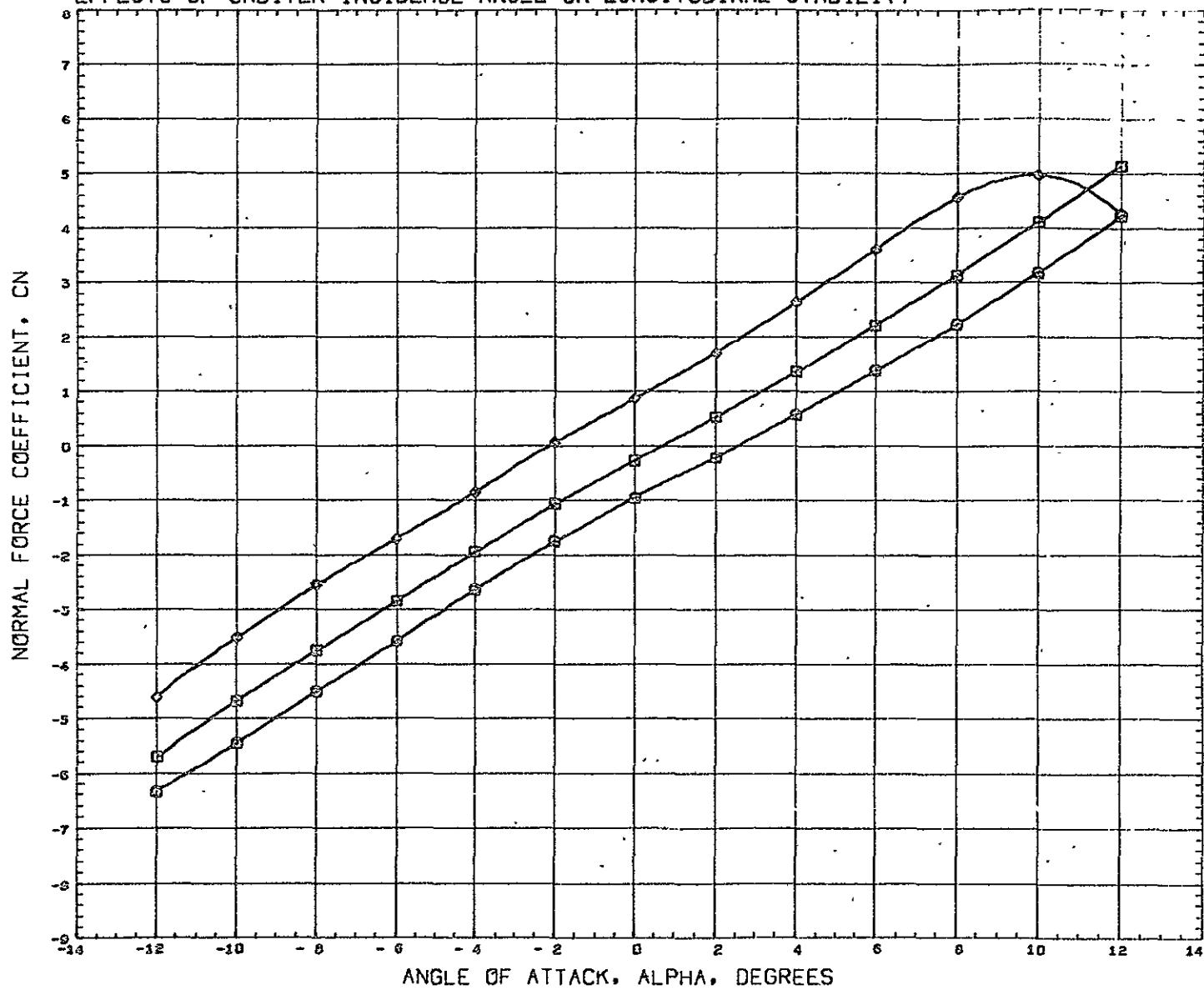
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○	2.000		0.900 BETA 0.000
□	1.000		
◊	4.000		

REFERENCE INFORMATION		
CFS	1.3980	SQ. IN.
CFL	1.3330	INCHES
CFB	1.3330	INCHES
IRF	5.2640	INCHES
IRP	0.0000	INCHES
IRP	0.0330	INCHES
CALE	0.0034	

DATA MIST. CODE MHIF

MSFC 476 NR HCR0RB/S-1CB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 217

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



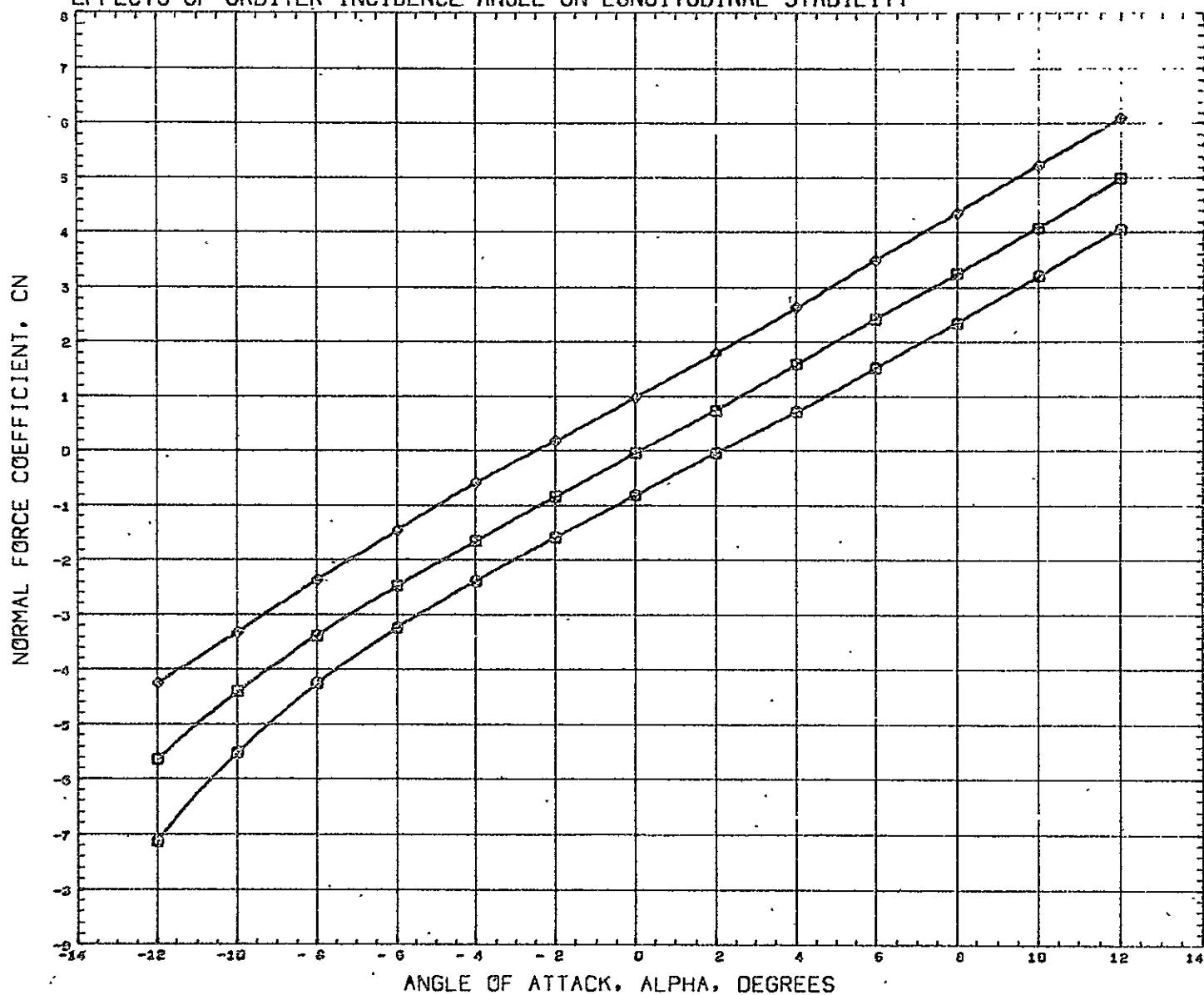
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<input type="checkbox"/>	4.000			

DATA LIST. CODE MMIF

REFERENCE INFORMATION		
EFS	1.3960	SQ.IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 218

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



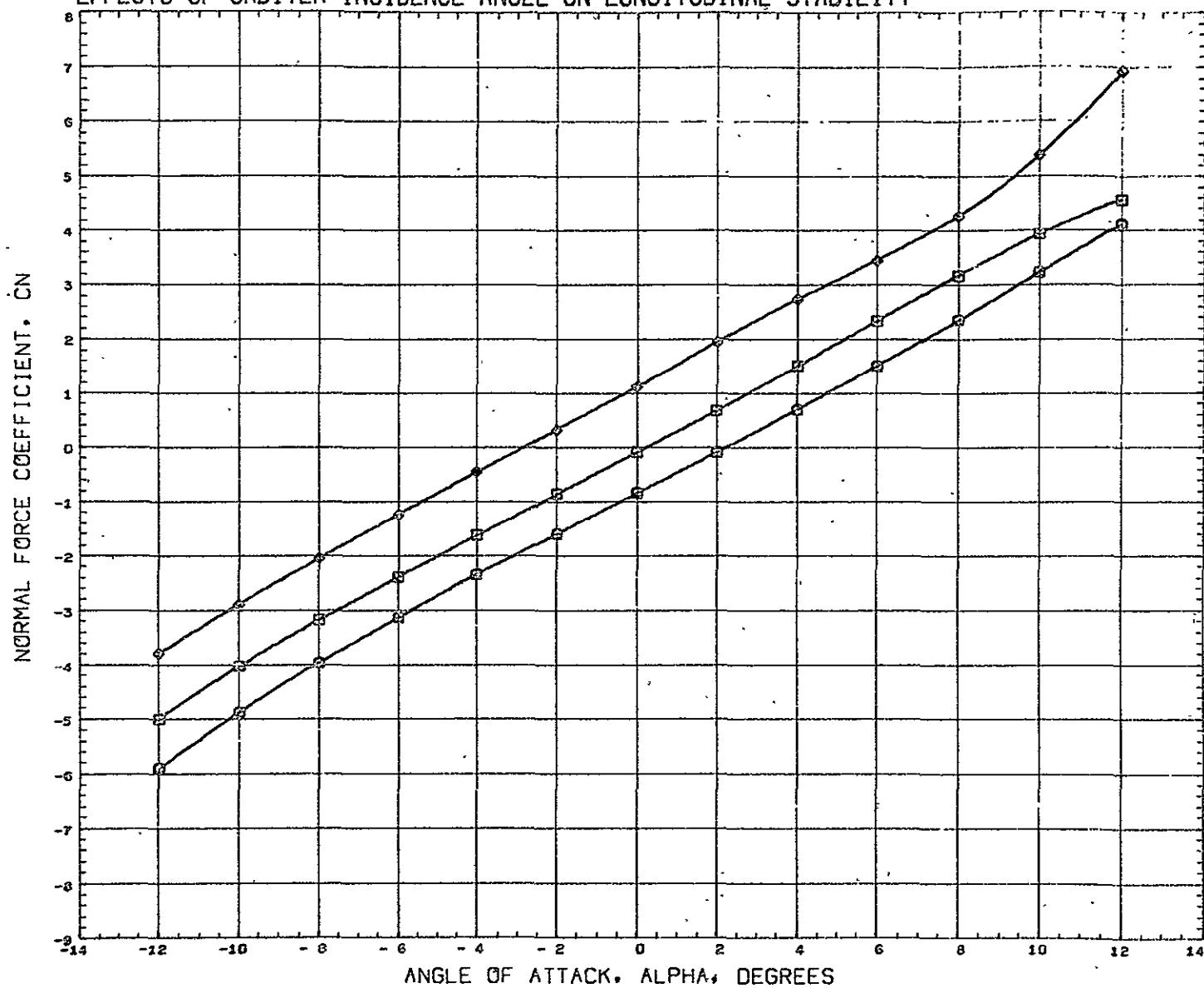
SYMBOL	ORIGIN	PARAMETRIC VALUES		
		MACH	1.100	BETA
□	2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MHJF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 219

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



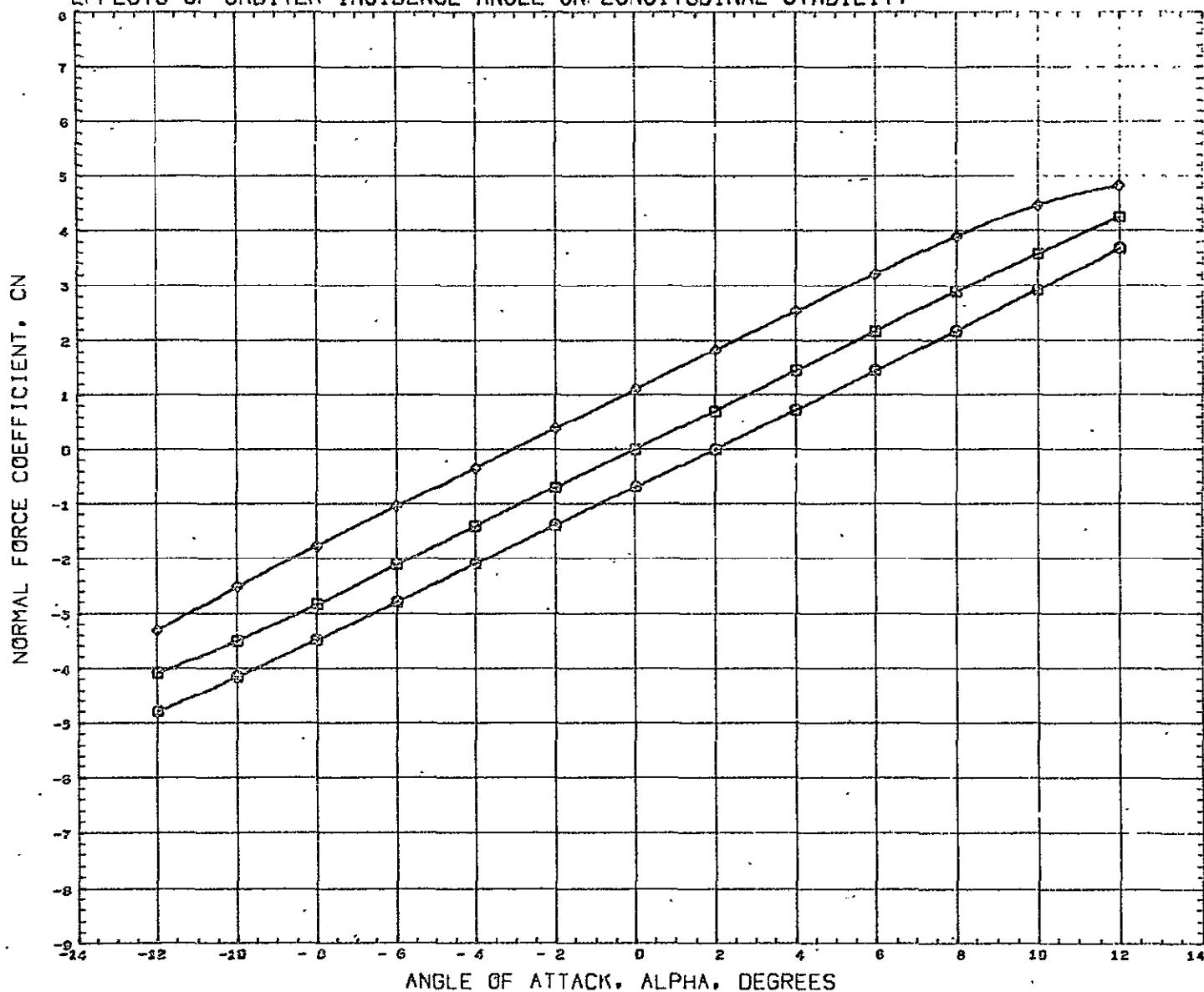
		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.200	BETA
□	- 2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
EFS	1.3960	SQ.IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 220

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

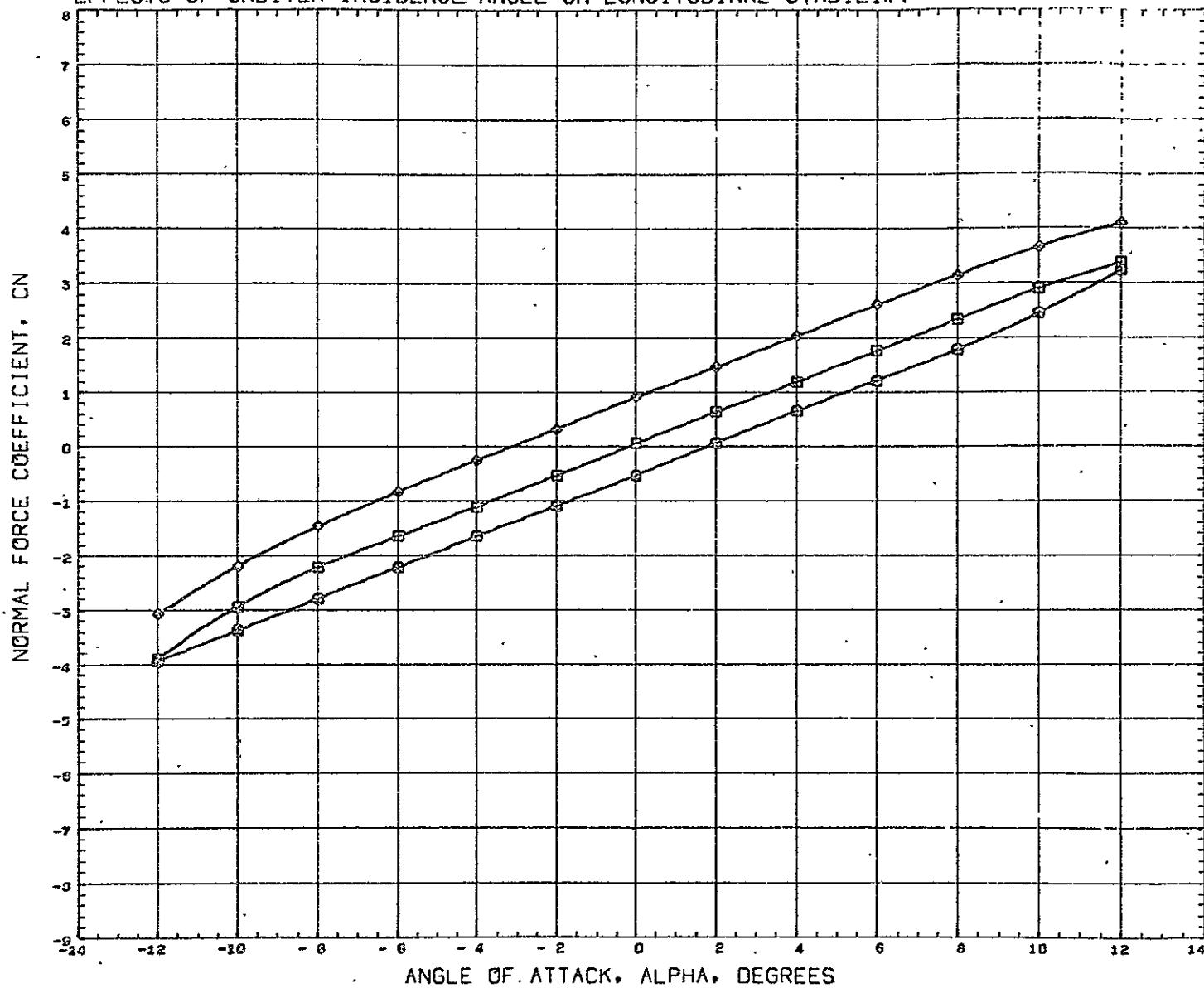


		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.460	BETA
○	- 2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
MRF	0.0330	INCHES
CALE	0.0034	

DATA MIST. CODE MMIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



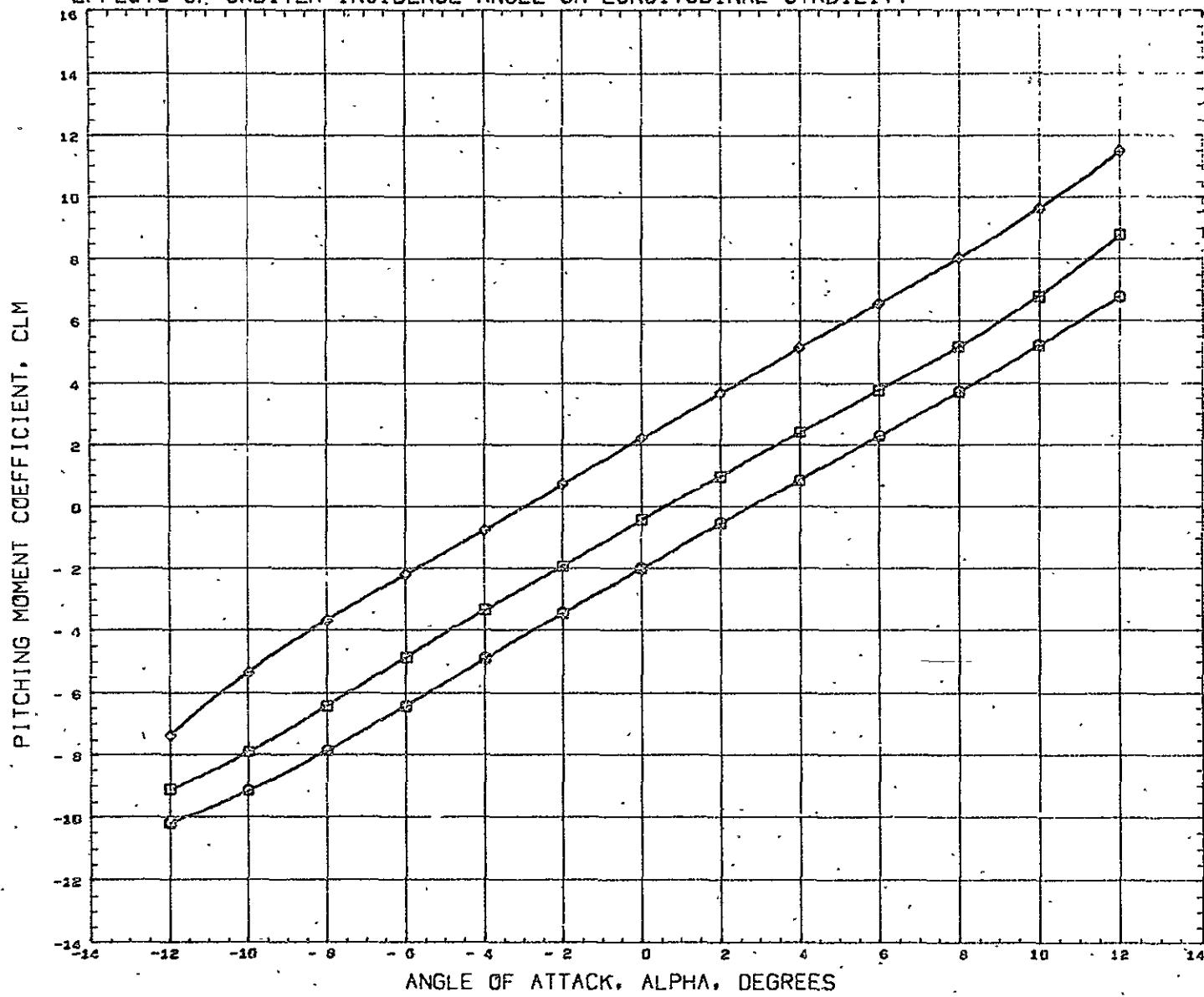
SYMBOL ORBINC PARAMETRIC VALUES
 ○ - 2.000 MACH 1.960 BETA 0.000
 □ 1.000
 ◇ 4.000

DATA HIST. CODE MMIF

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XNRP 5.2640 INCHES
 YNRP 0.0000 INCHES
 ZNRP 0.0330 INCHES
 SCALE 0.0034

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 222

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

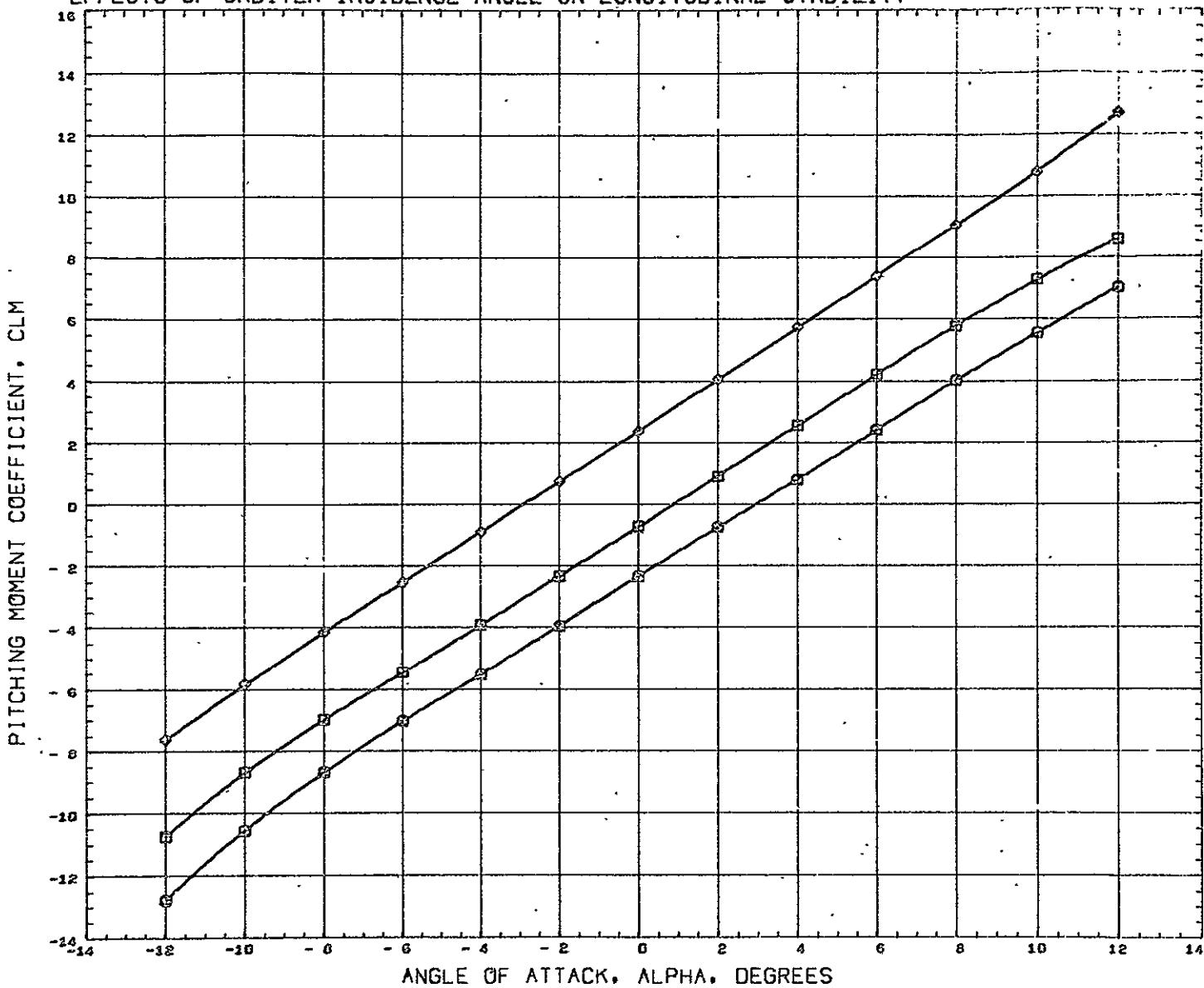


SYMBOL	ORBINC	MACH	PARAMETRIC VALUES		
□	- 2.000		0.600	BETA	0.000
□	1.000				
◊	4.000				

DATA LIST, CODE NINE

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



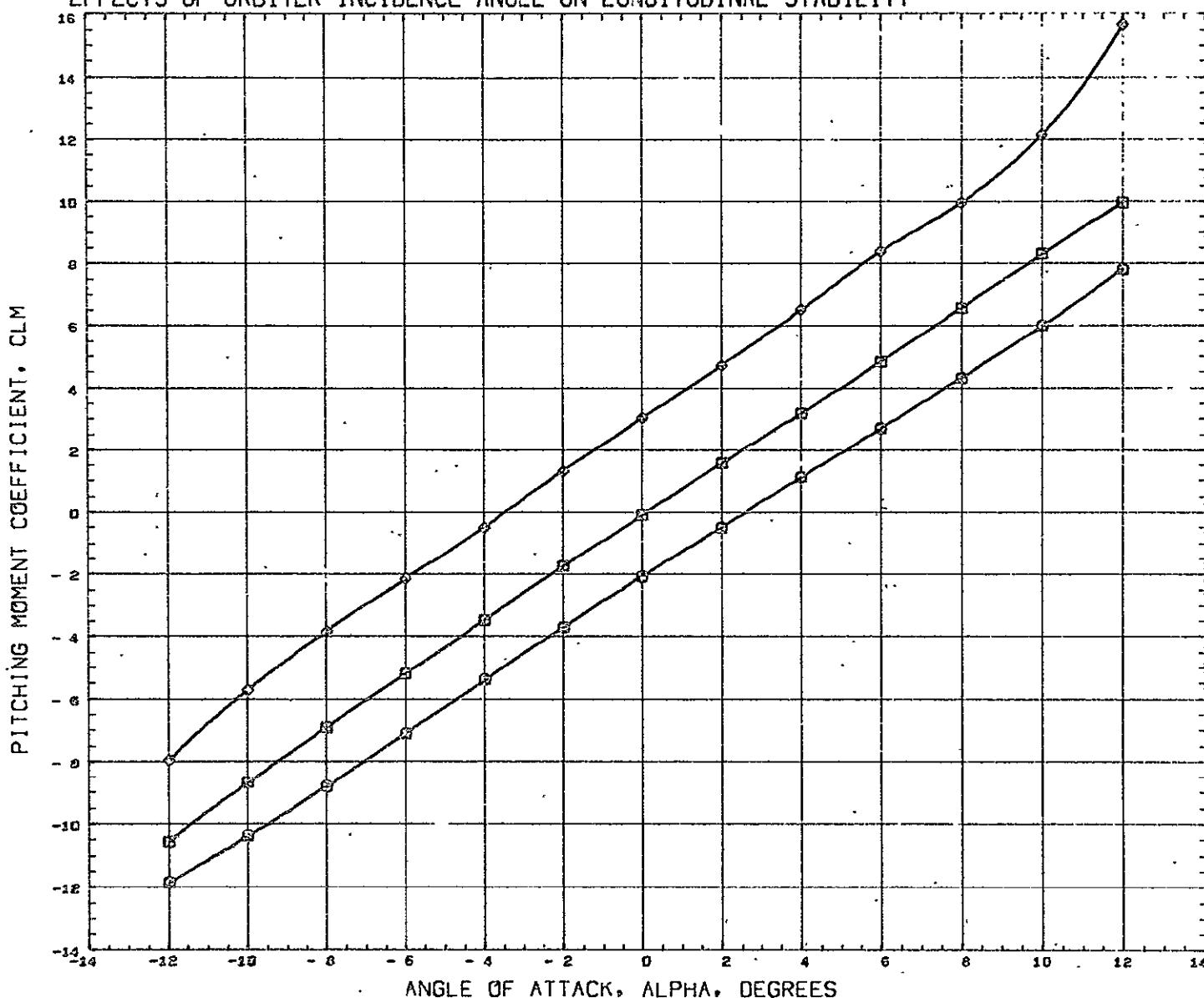
SYMBOL ORBINC
 ◻ - 2.000 HACH
 □ 1.000
 ◆ 4.000

FARMETRIC VALUES
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DATA HIST. CODE MNIF

REFERENCE INFORMATION
 REFS 1.3960 SG.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



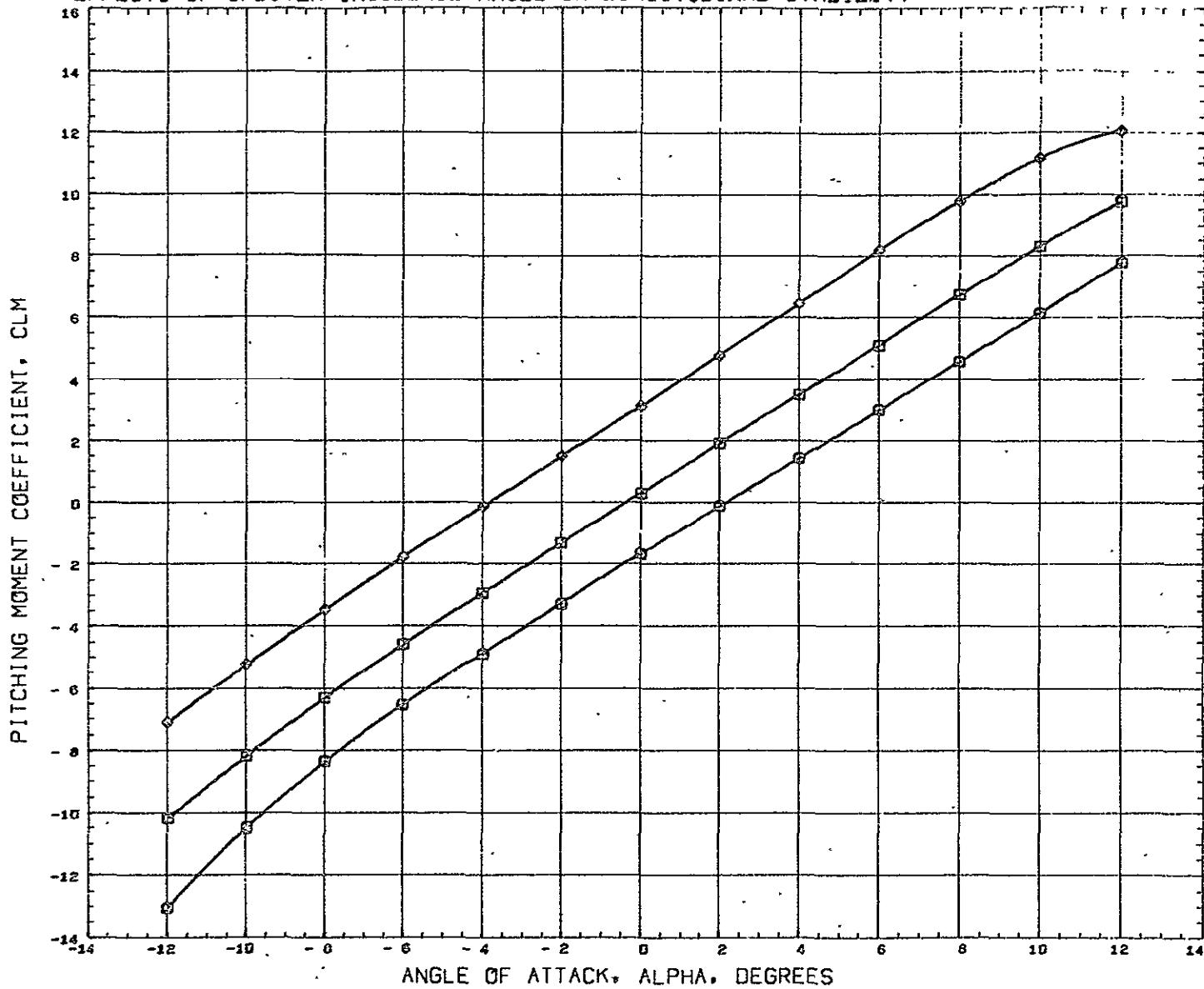
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O	- 2.000		1.000 BETA 0.000
D	1.000		
◊	4.000		

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	INCHES

DATA HIST. CODE NMIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 225

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



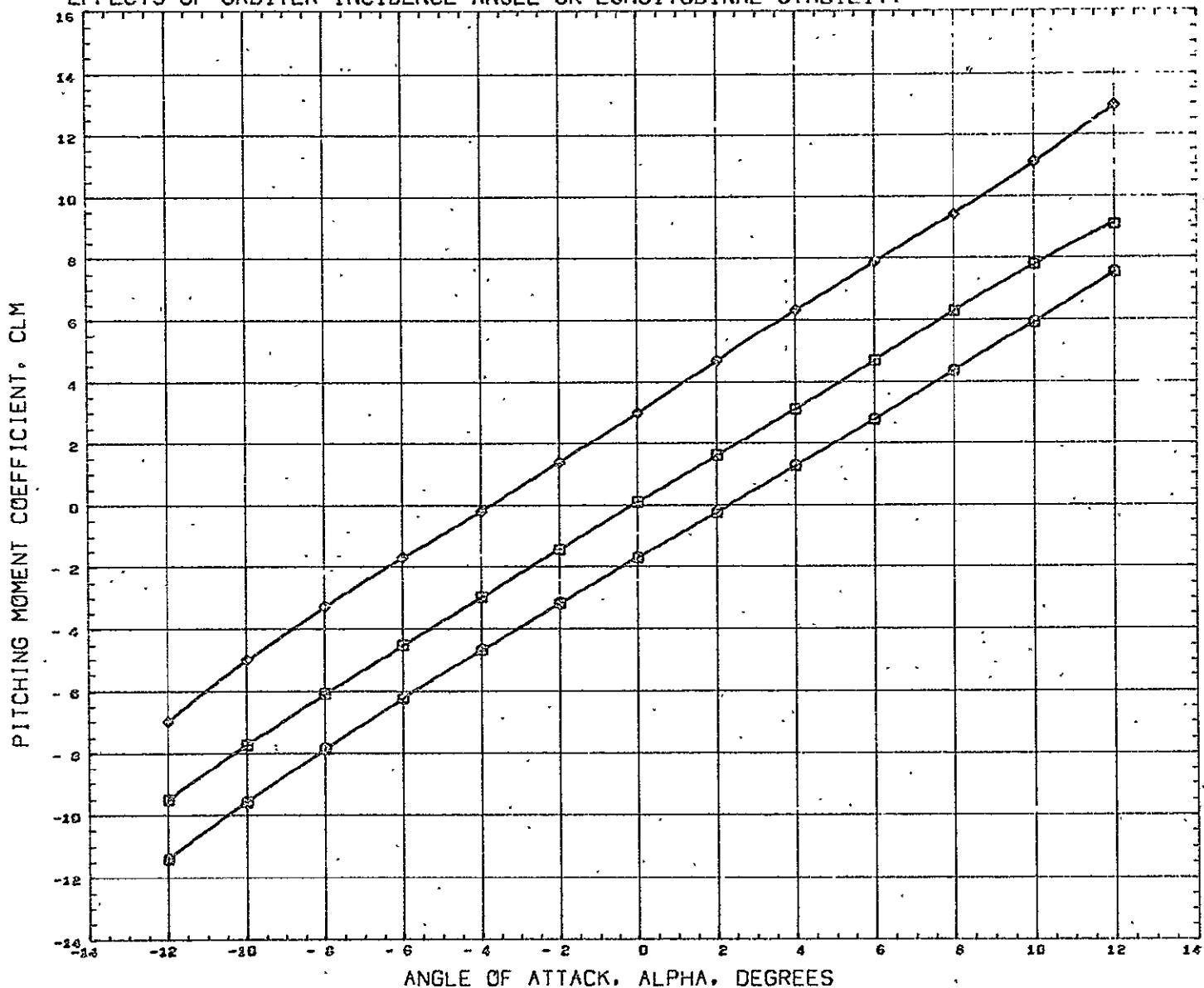
		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.100	BETA
○	-	2.000		0.000
□		1.000		
◊		4.000		

DATA LIST FILE 1

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 226

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



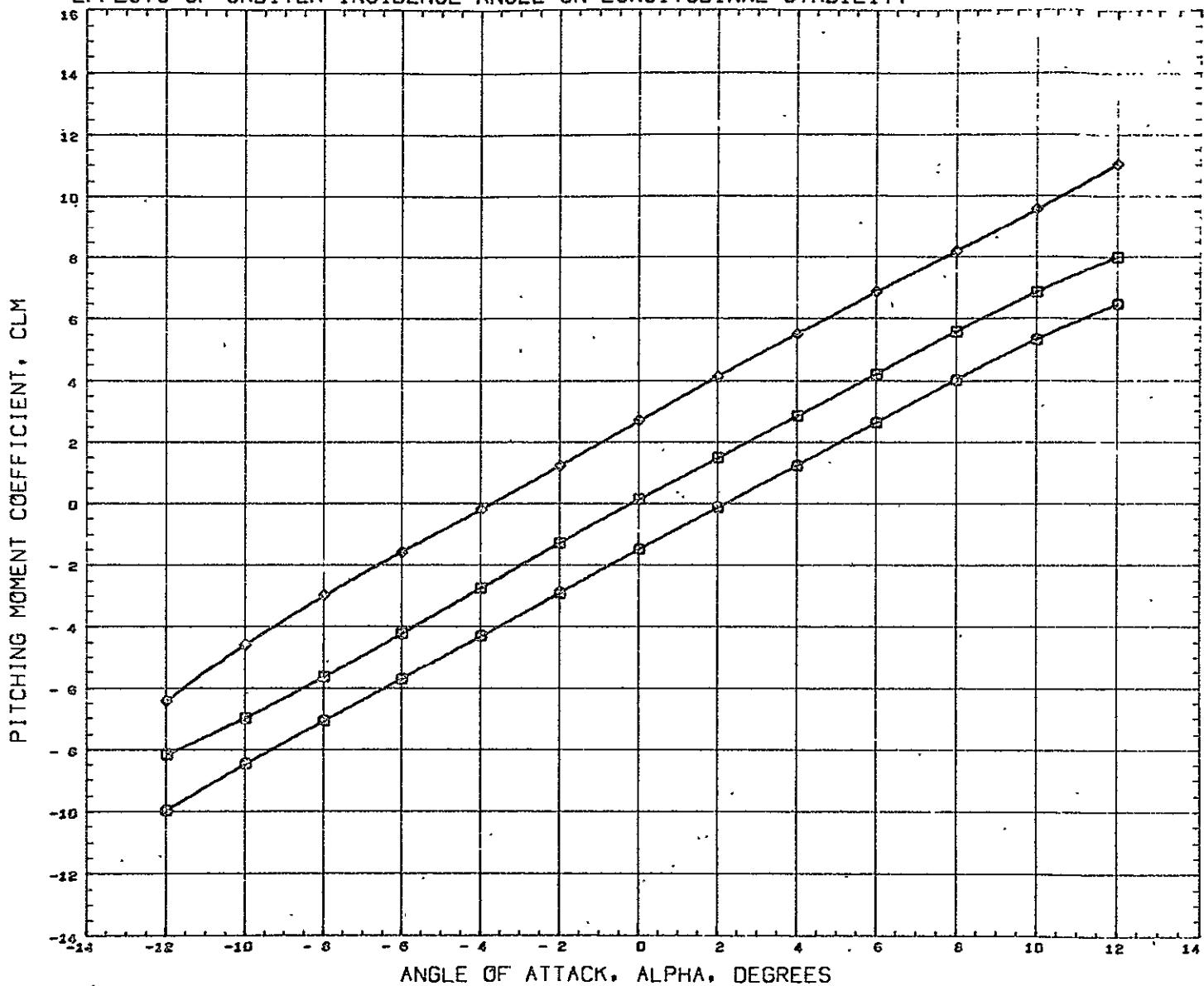
SYMBOL	ORBINC	PARAMETRIC VALUES		
○	- 2.000	MACH	1.200	BETA
□	1.000			
◊	4.000			

DATA HIST. CODE MNIF

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE . 227

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



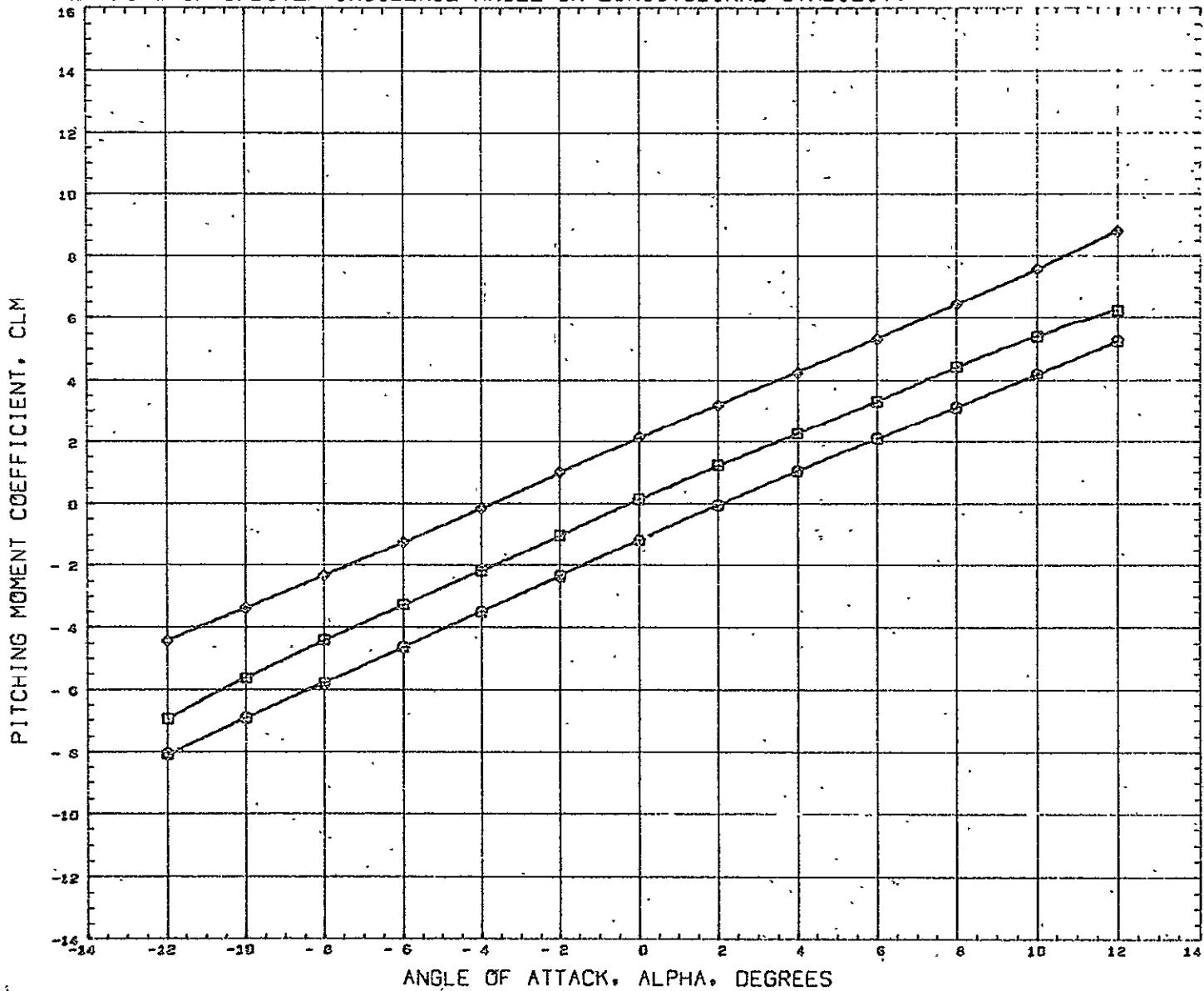
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SYMBOL	ORBINC	MACH	1.460	BETA
□	- 2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRR	5.2640	INCHES
YHRR	0.0000	INCHES
ZHRR	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 228

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



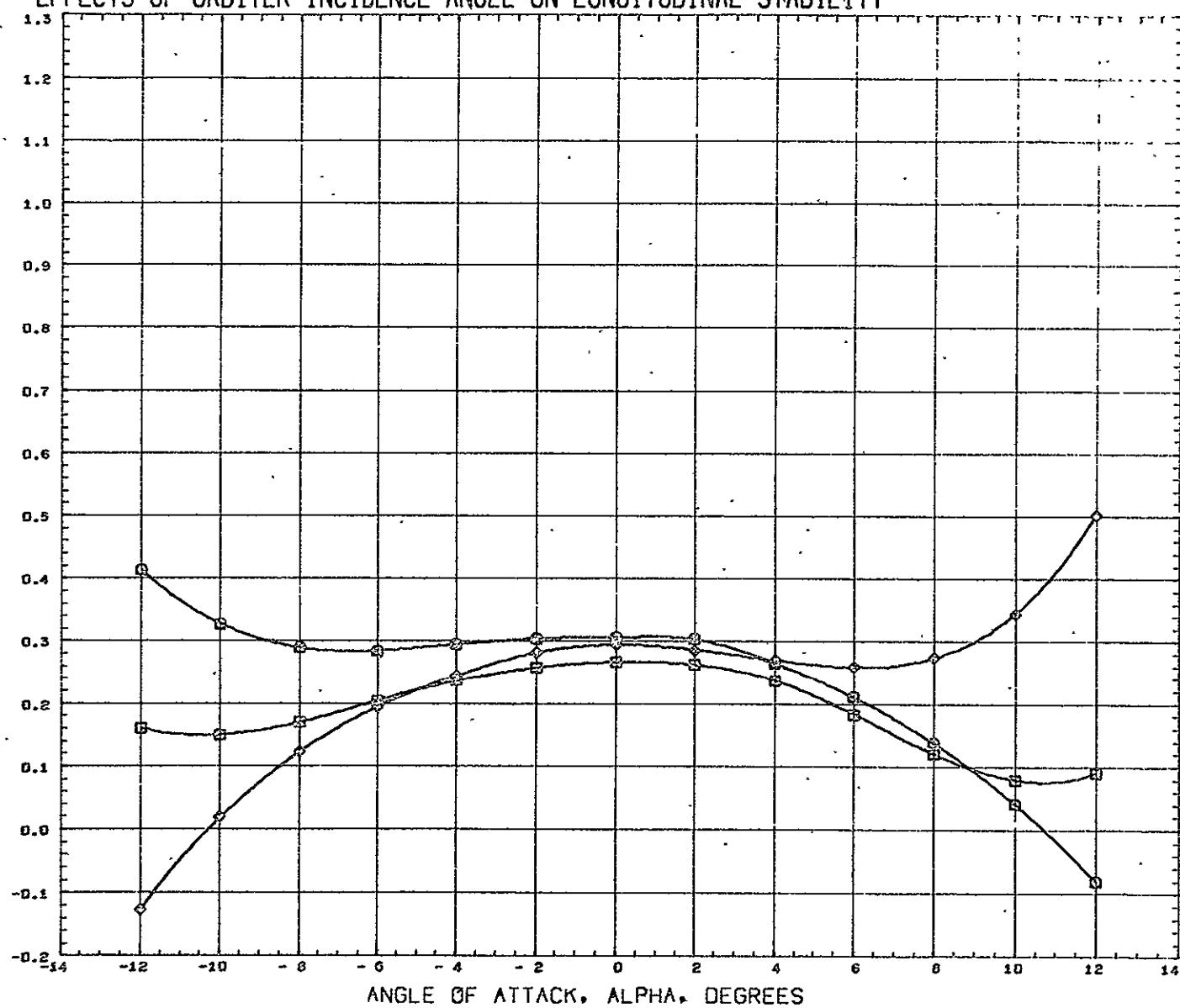
SYMBOL	ORBINC	PARAMETRIC VALUES		
		MACH	1:96D	BETA
□	2.000			0.000
□	1.000			
◊	4.000			

DATA HIST. CODE MNIF

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRP	5.2640	INCHES
YHMRP	0.0000	INCHES
ZHMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



SYMBOL ORBINC
 □ - 2.000
 □ 1.000
 ◇ 4.000

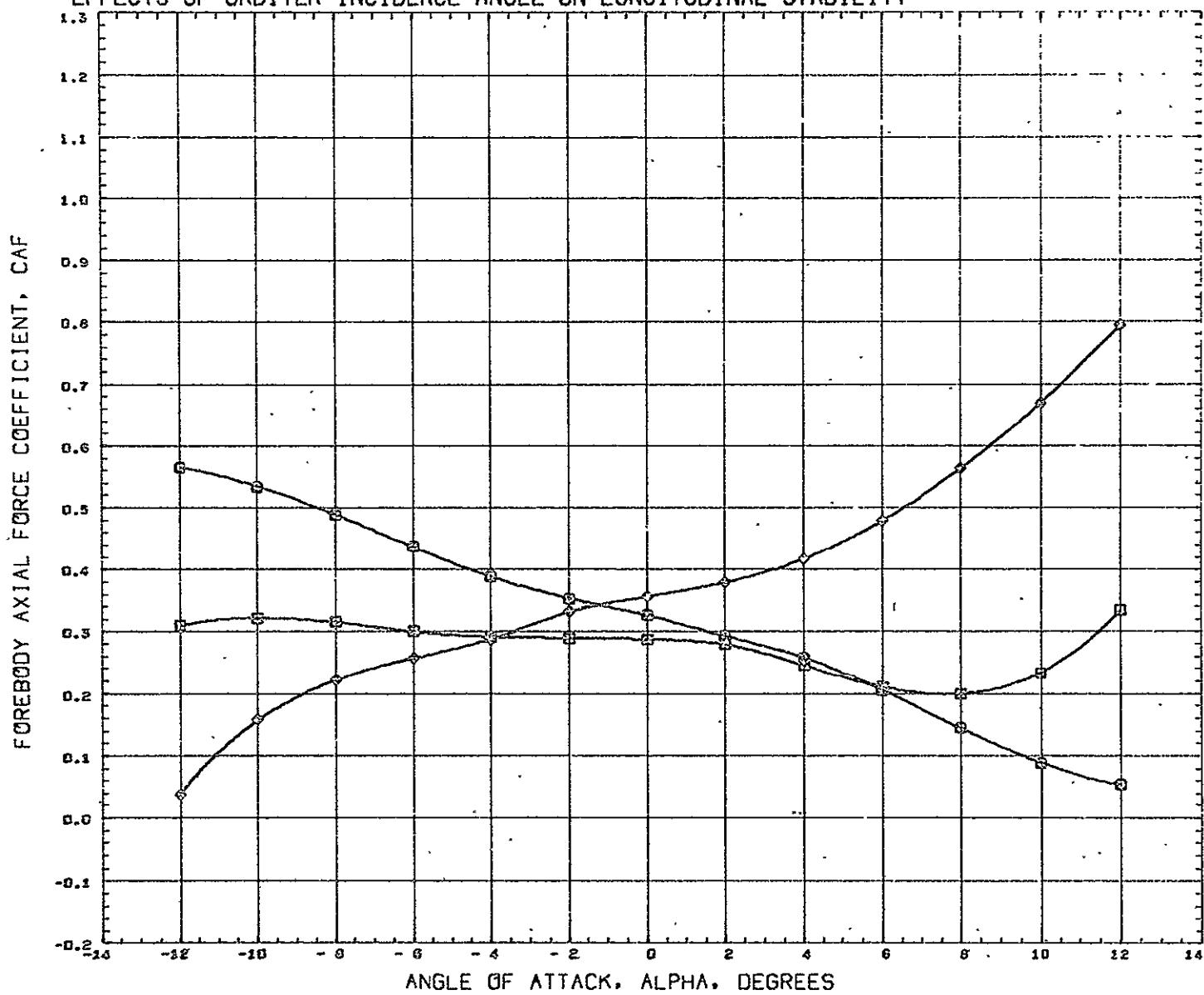
PARAMETRIC VALUES
 MACH 0.600 BETA 0.000

REFERENCE INFORMATION
 REFS 1.3960 SG. IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRP 0.0000 INCHES
 ZNRP 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE NMIF

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 230

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL ORBINC

PARAMETRIC VALUES

○	- 2.000	MACH	0.900	BETA	0.000
□	1.000				
◆	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	INCHES

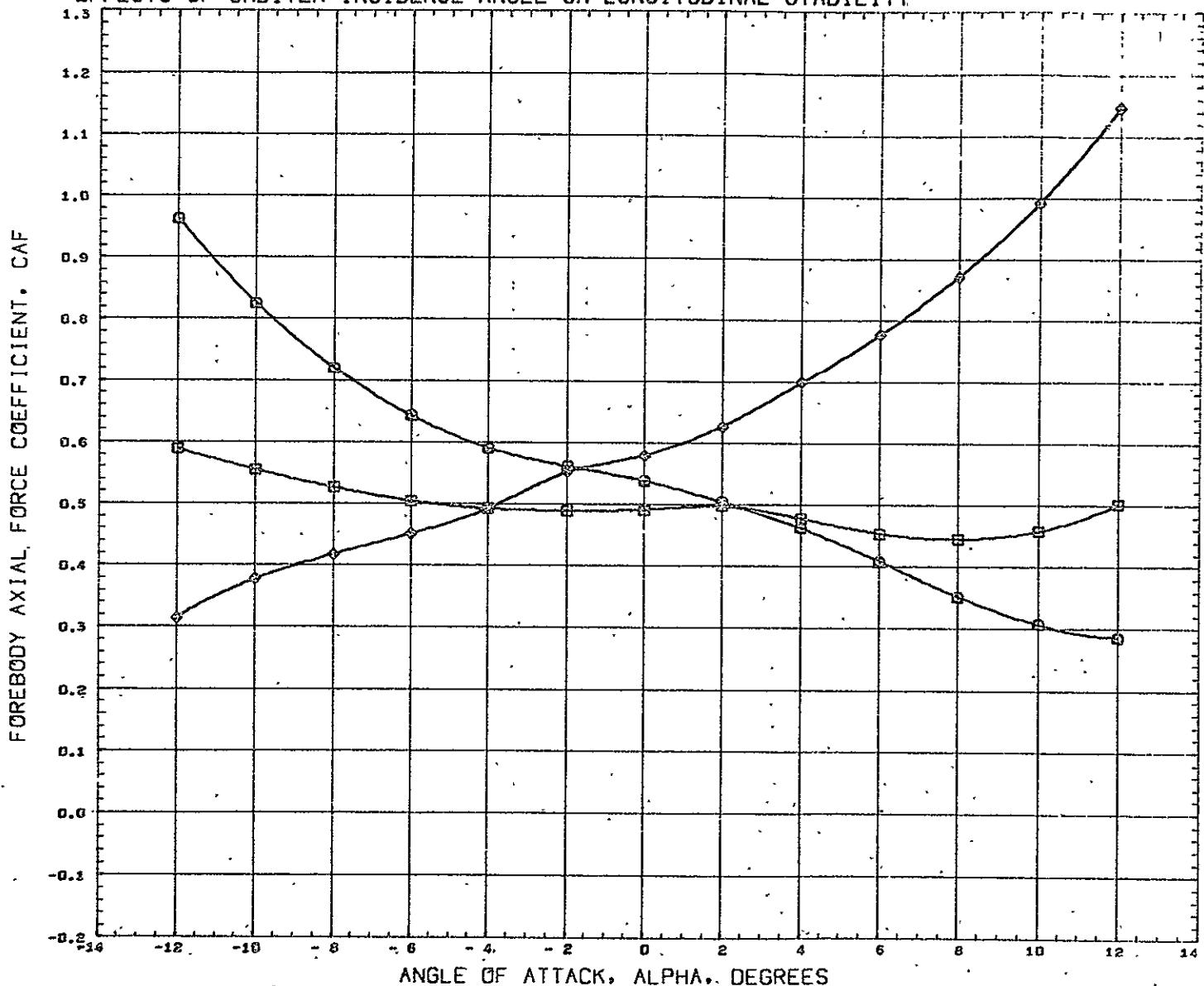
DATA HIST. CODE HHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17

(A25081) 14 JAN 71

PAGE 231

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



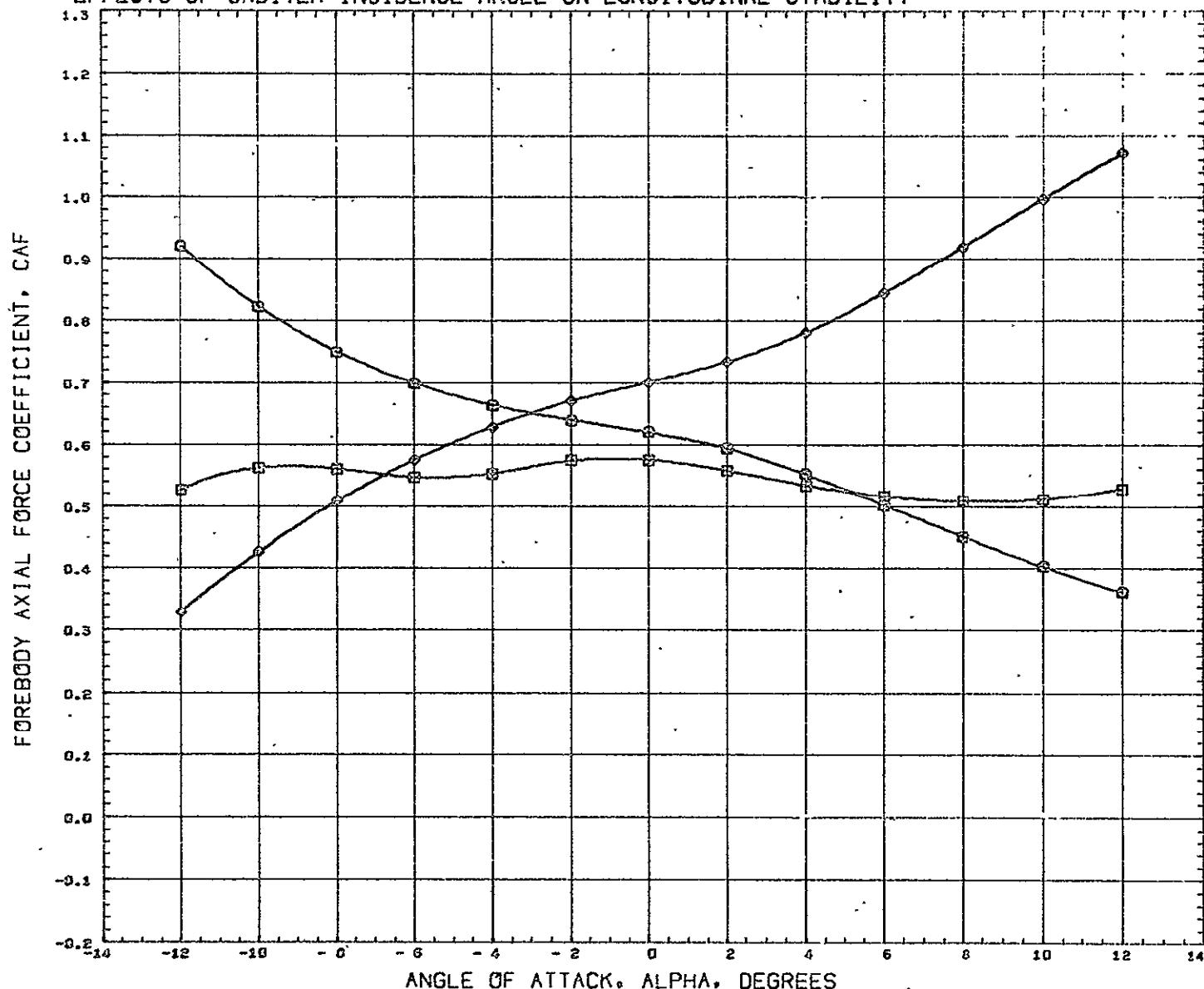
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SYMBOL	ORBINC	MACH	1.000	BETA
○	2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRF	5.2640	INCHES
YHMR	0.0000	INCHES
ZHMR	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE HHIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 [A25081] 14 JAN 71 PAGE 232

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

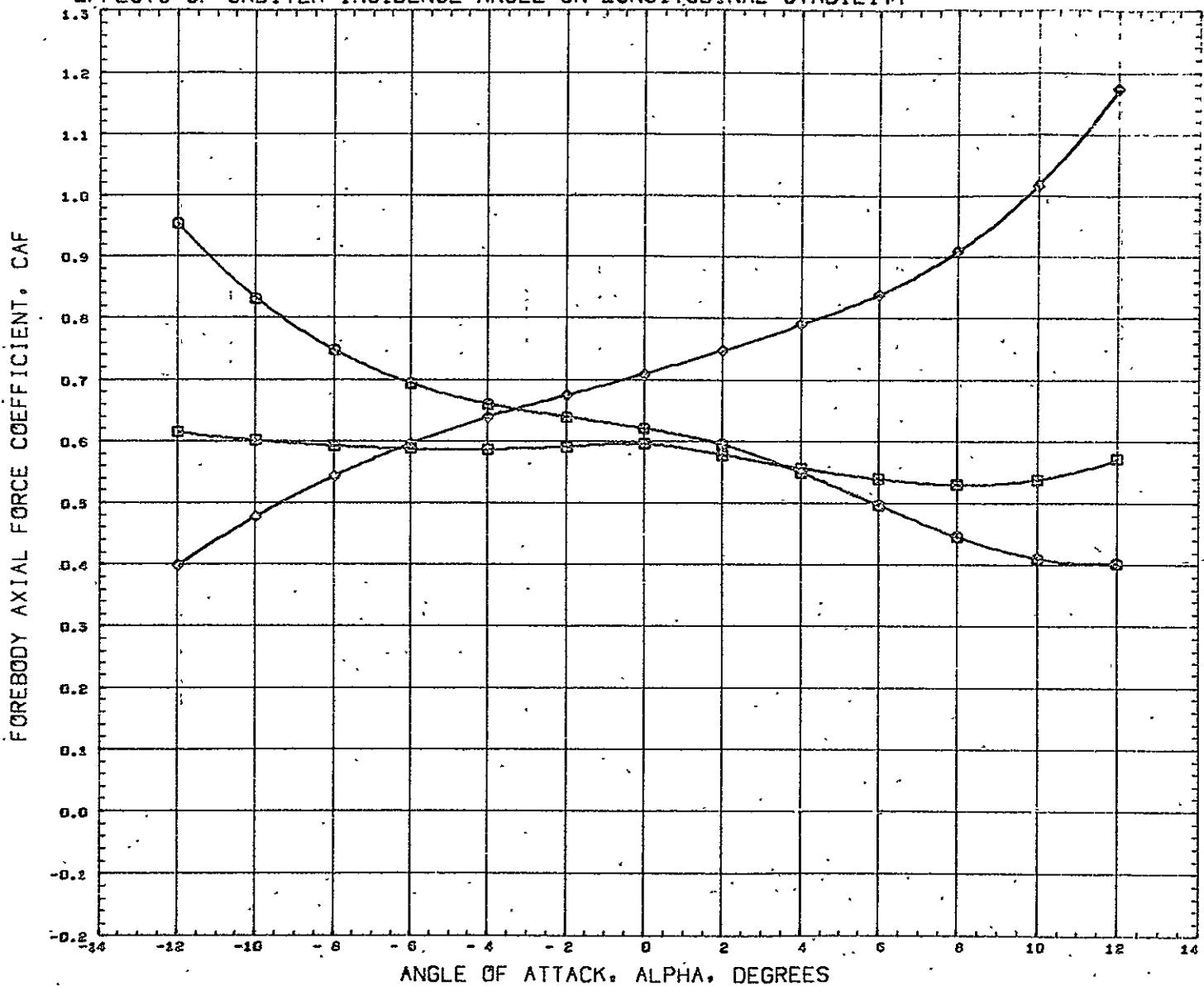


		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.100	BETA
○	- 2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
FB	1.3330	INCHES
RF	5.2640	INCHES
RFP	0.0000	INCHES
HRP	0.0330	INCHES
CALE	0.0034	

DATA MIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



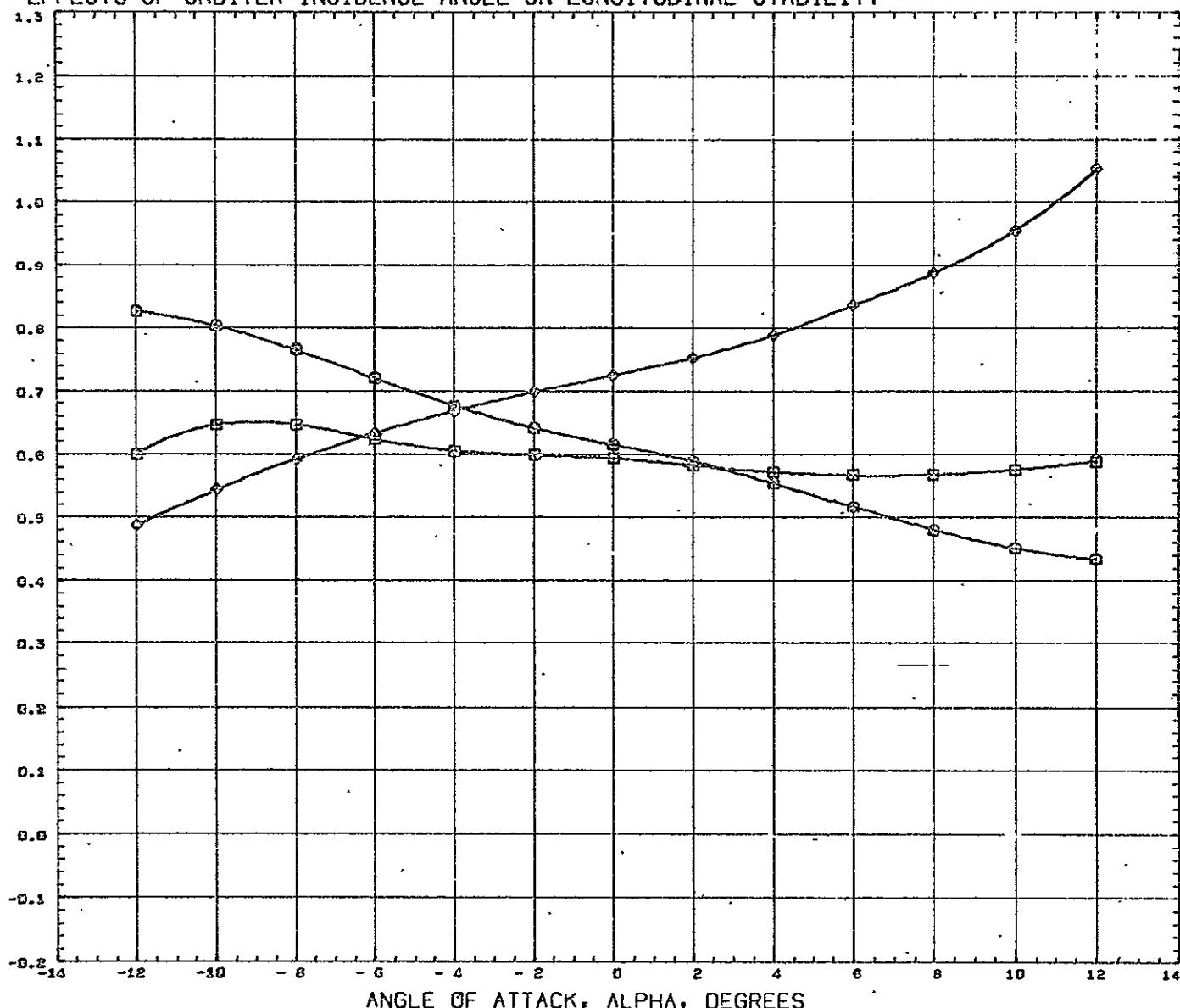
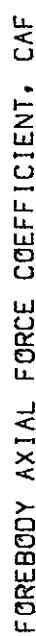
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<input type="checkbox"/>		1.000			
<input type="checkbox"/>		4.000			

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMR	5.2640	INCHES.
YMRF	.0.0000	INCHES
ZHMR	0.0330	INCHES
SCALE	0.0034	

DATA MIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 234

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

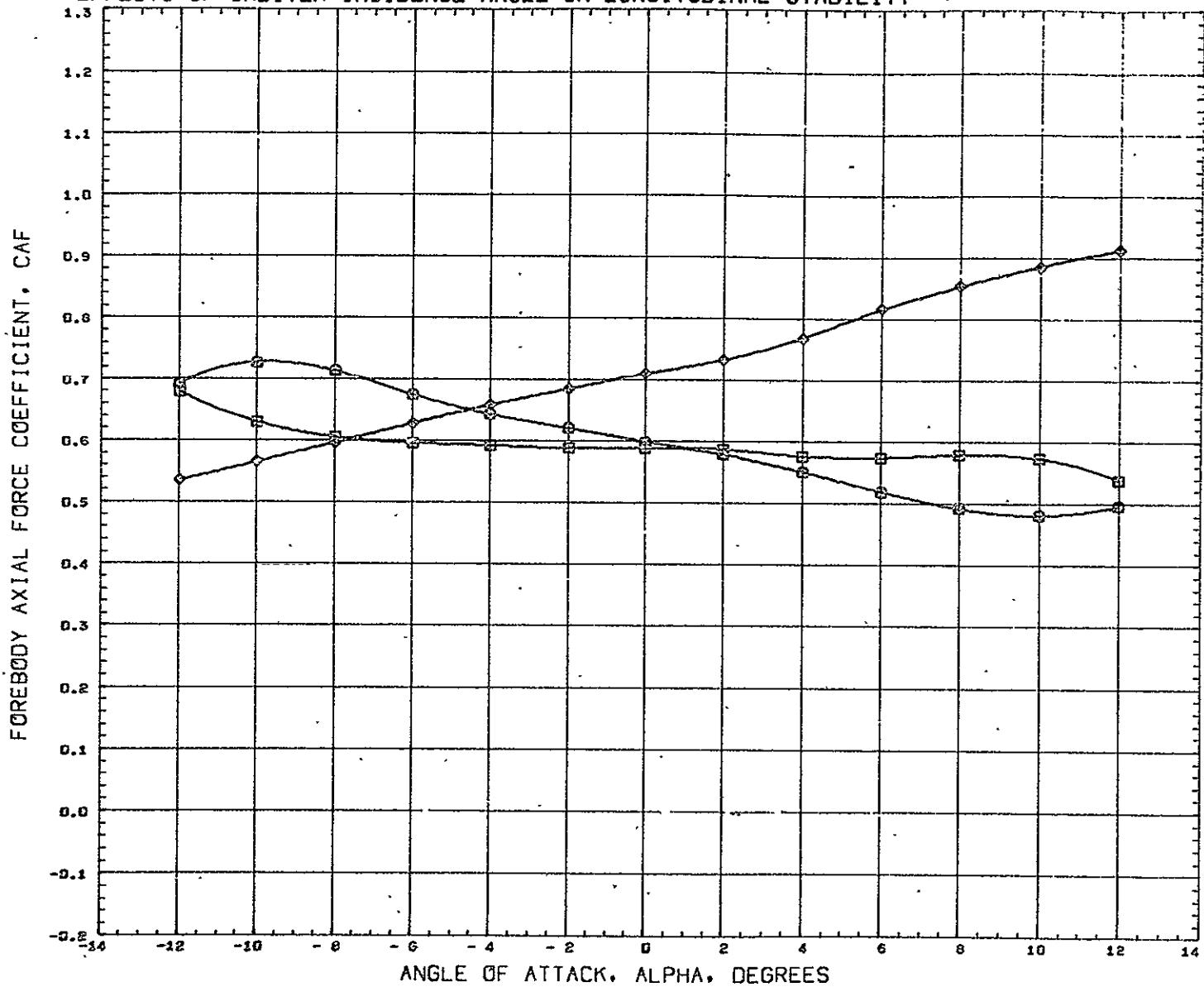


SYMBOL	ORIGIN	MACH	PARAMETRIC VALUES
O	- 2.000	1.460	BETA 0.000
□	1.000		
◊	4.000		

DATA MIST. CODE MMIF

REFERENCE INFORMATION		
REFS	1.3960	SO. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



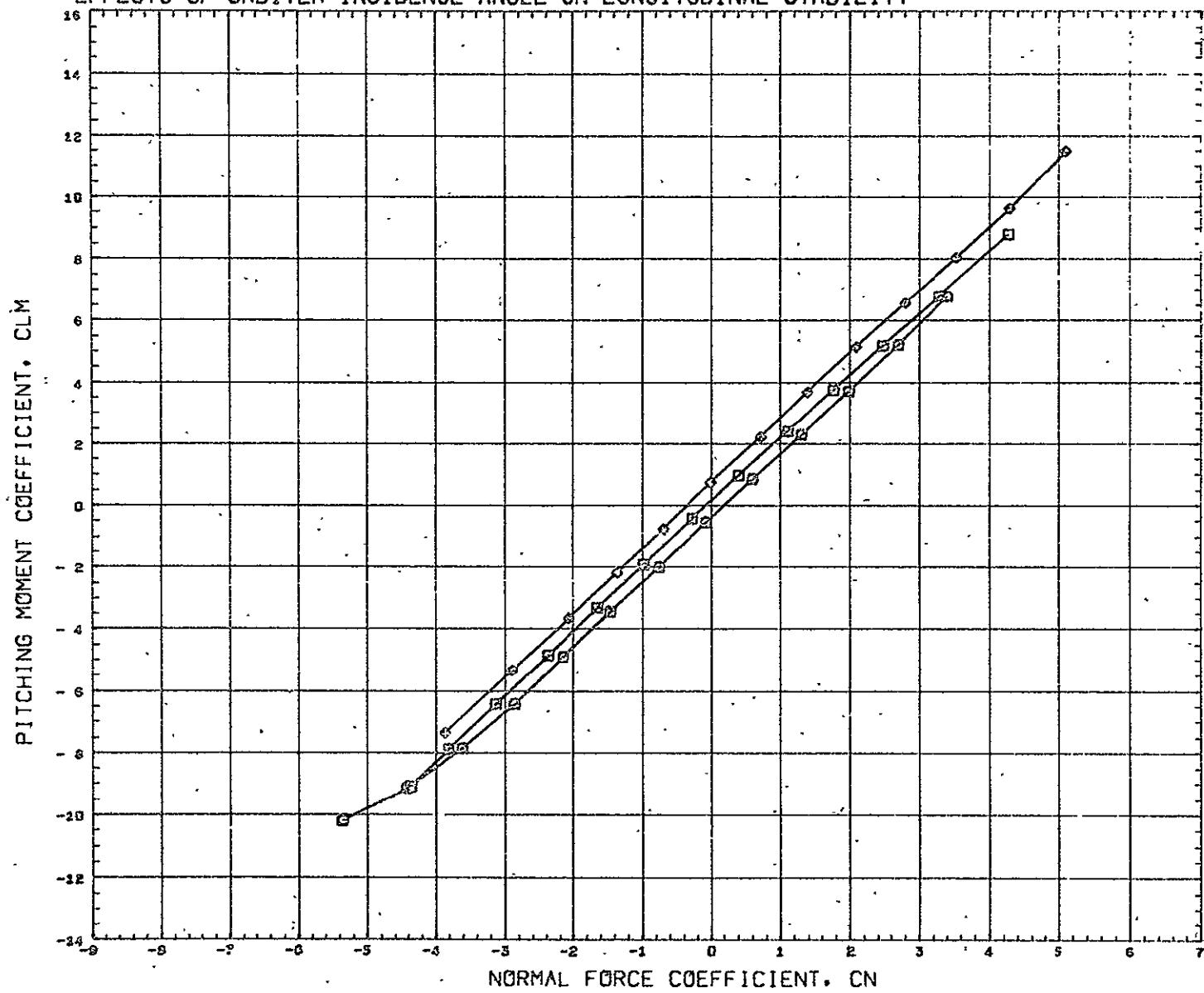
		PARAMETRIC VALUES		
SYMBOL	ORBINC	MACH	1.960	BETA
○	-	2.000		0.000
□		1.000		
◊		4.000		

DATA MIST. CODE MHIF

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC-476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 [A25081] 14 JAN 71 PAGE 236

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



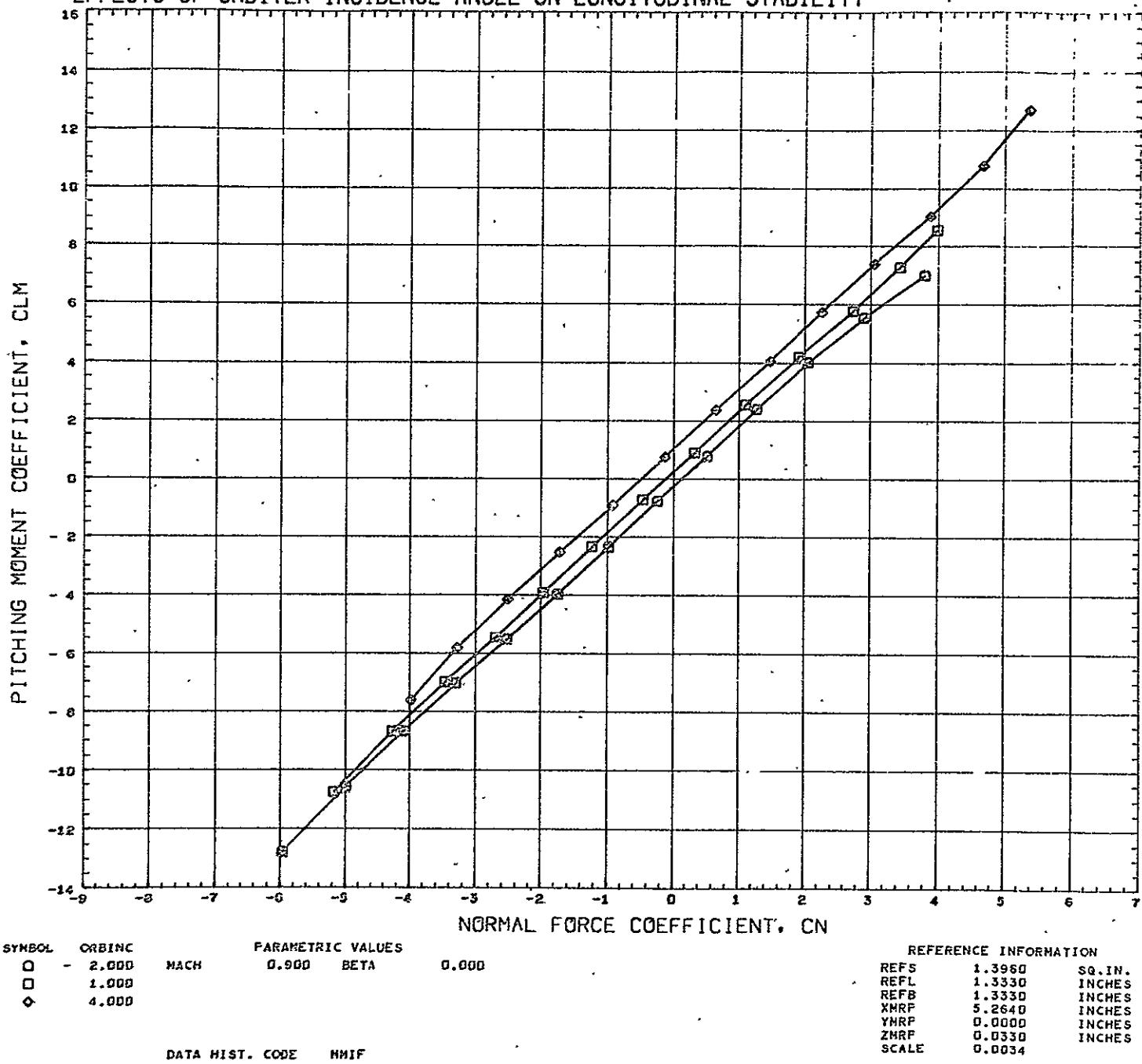
SYMBOL	ORDINC	MACH	PARAMETRIC VALUES
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□	1.000		
◊	- 4.000		

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRP	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA-HIST. CODE MH1F

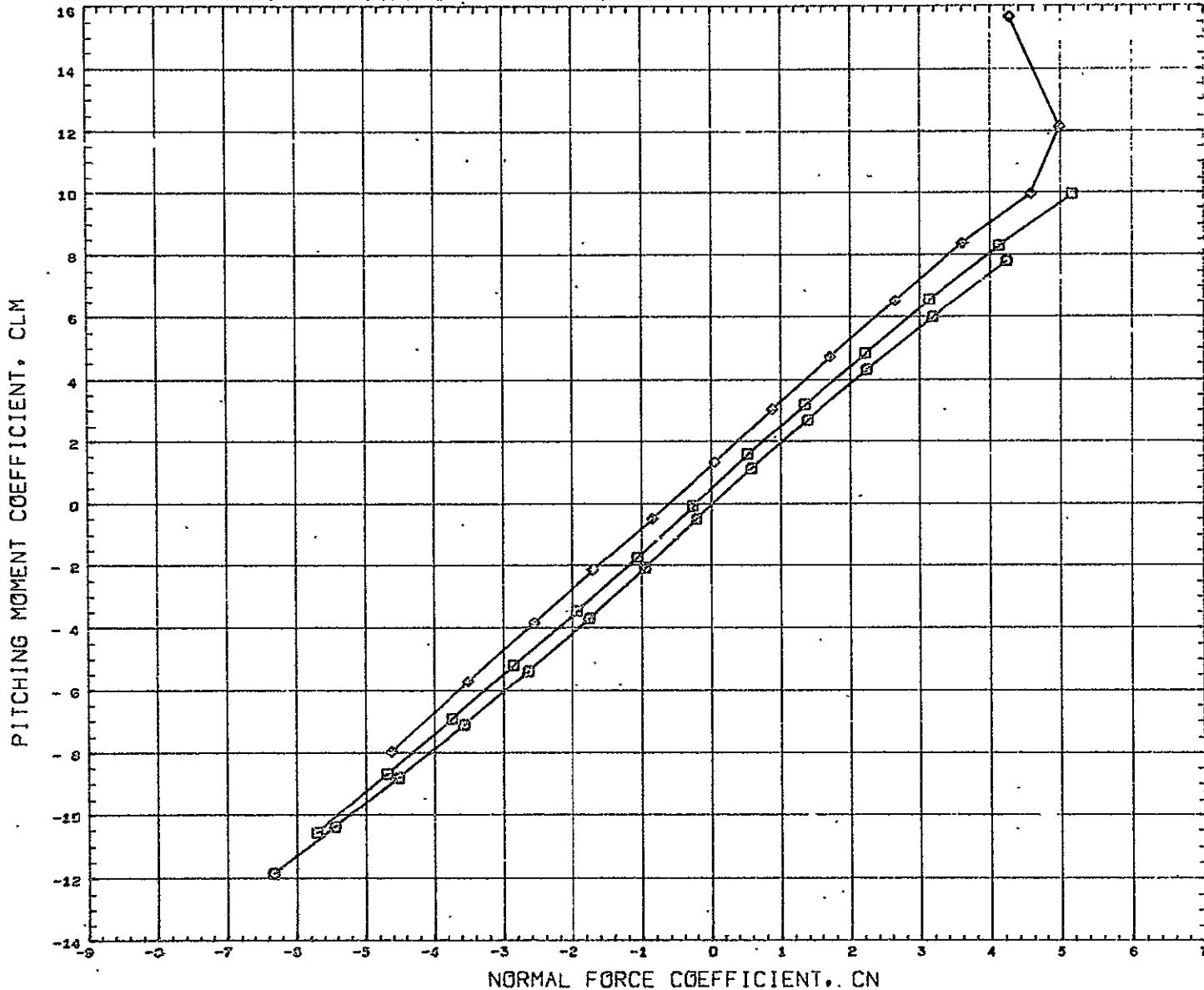
MSFC 476 NR HCR0RB/S-ICB0GSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 237

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 238

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

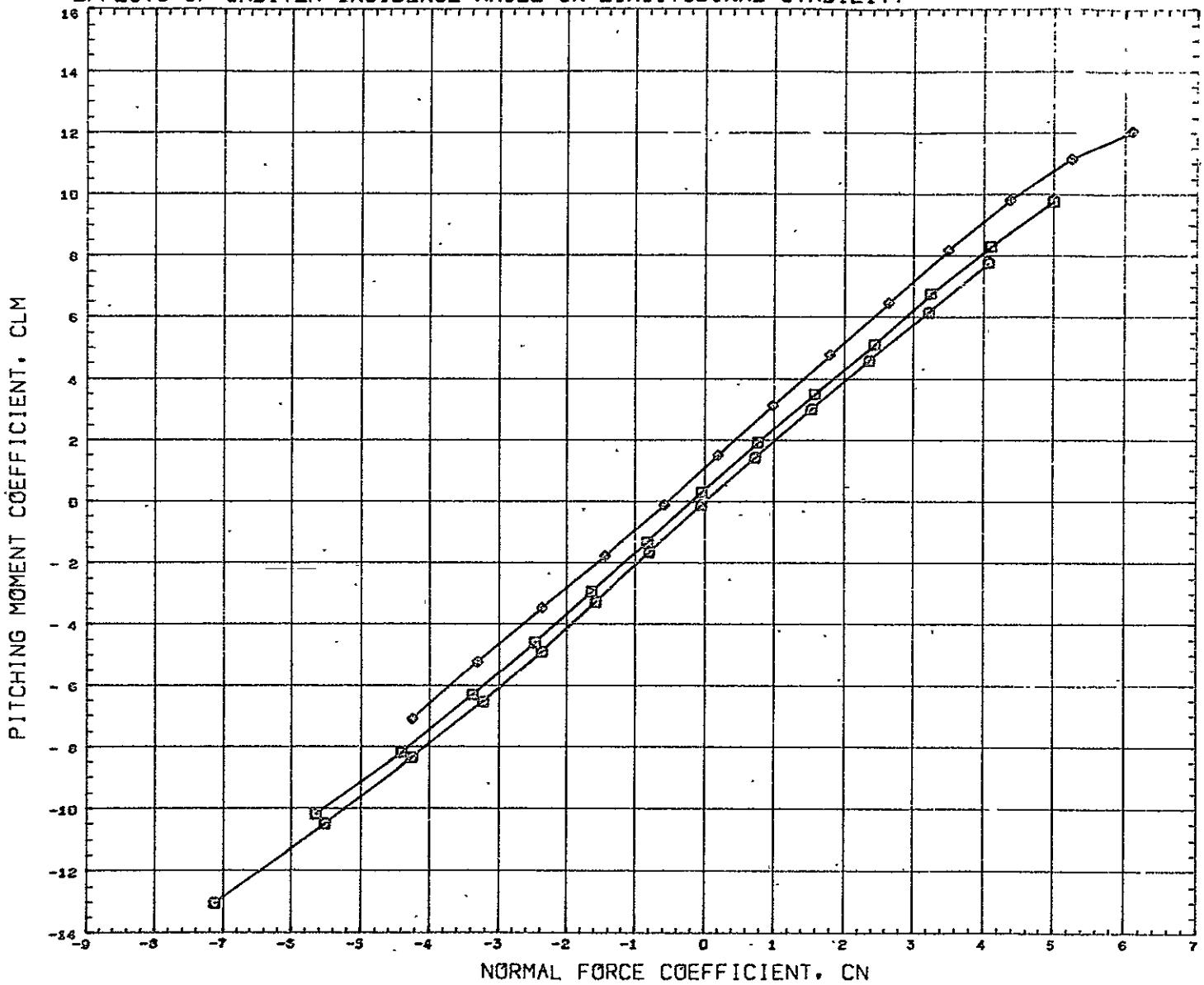


		PARAMETRIC VALUES		
SYMBOL	OBSCINC	MACH	1.000	BETA
○	- 2.000			0.000
□	1.000			
◊	4.000			

REFERENCE INFORMATION		
EFS	1.3960	SQ. IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
HRF	5.2640	INCHES
HRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



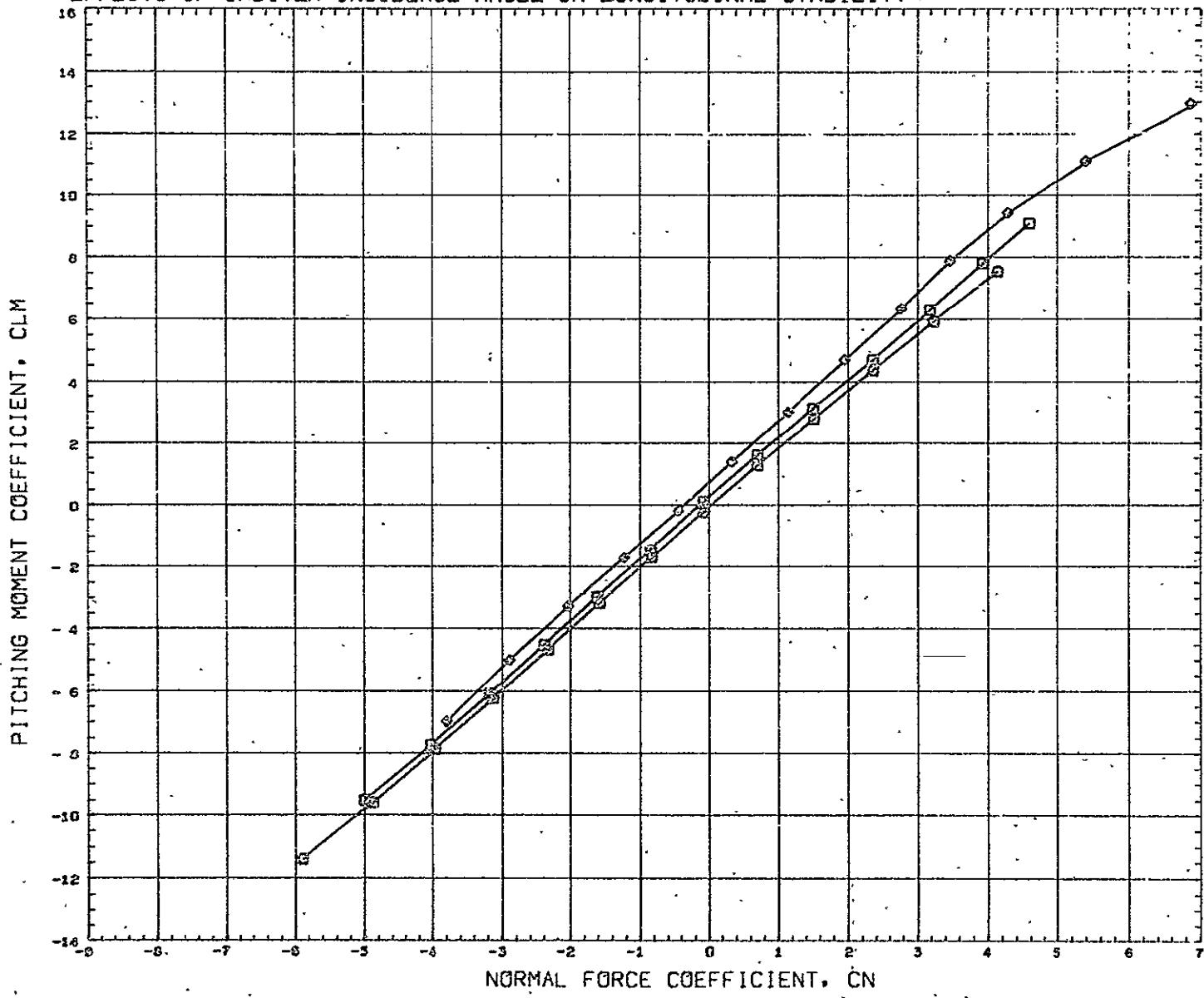
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<input type="checkbox"/>	1.000			
<input checked="" type="checkbox"/>	4.000			

PATA MIST. CODE MMIF

REFERENCE INFORMATION		
REFS	1.3960	SO. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 240

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



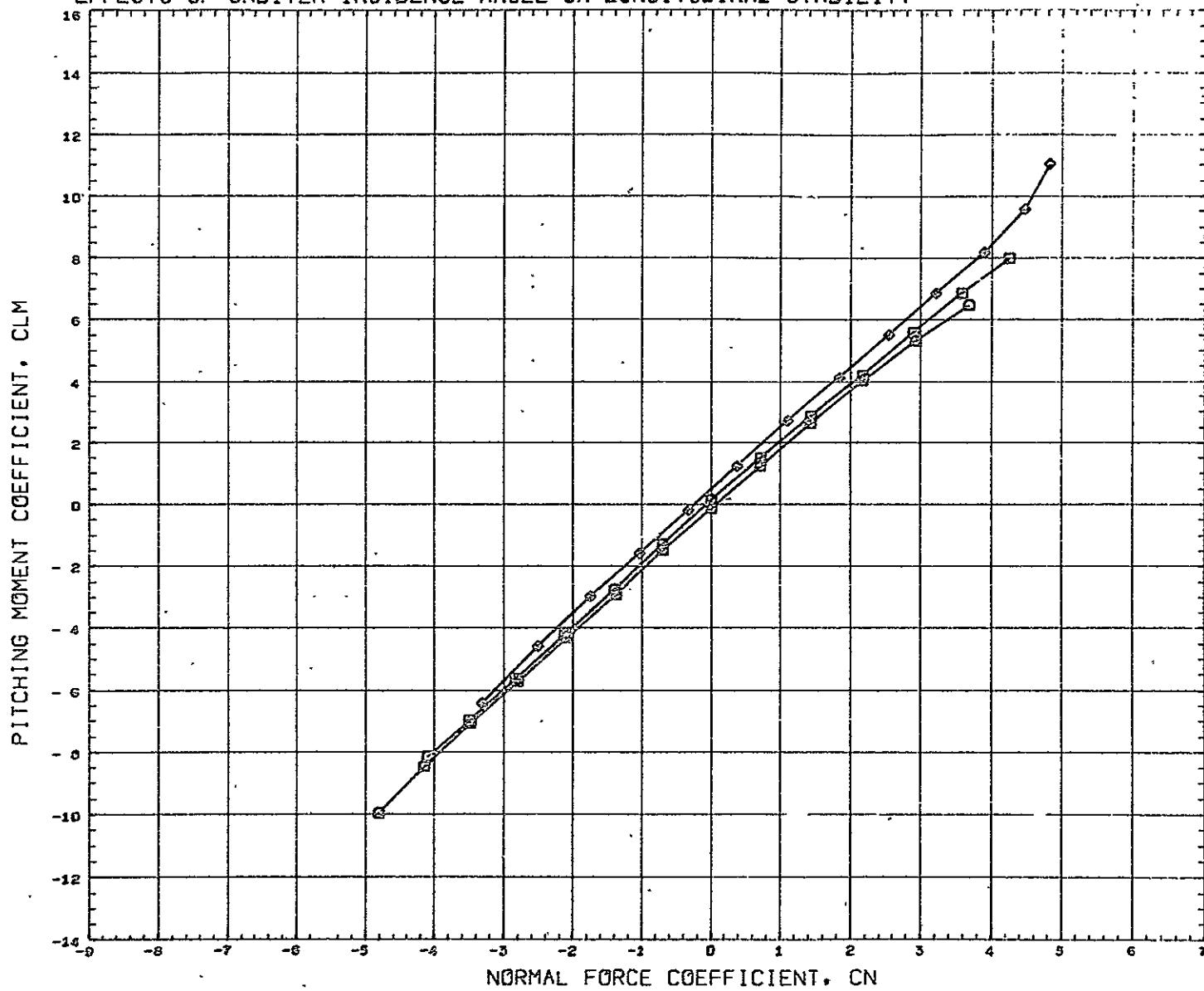
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SYMBOL	ORBINC	MACH	1.200	BETA
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□	+ 1.000			
◊	+ 4.000			

REFERENCE INFORMATION		
EFS	1.3960	SG:IN.
EFL	1.3330	INCHES
EFB	1.3330	INCHES
MRF	5.2640	INCHES
MRF	0.0000	INCHES
HRF	0.0330	INCHES
CALE	0.0034	

DATA HIST. CODE MMIF

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 241

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



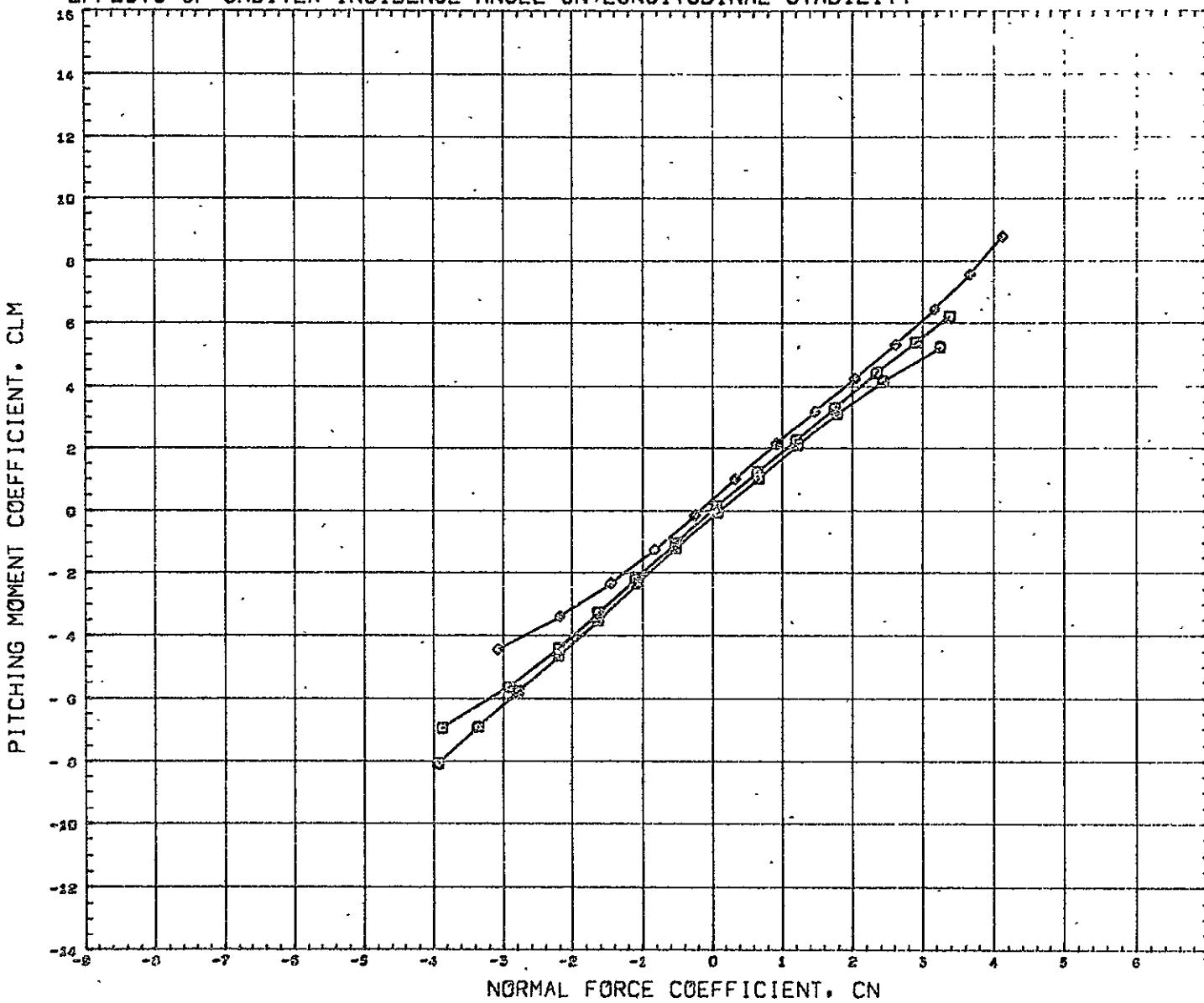
SYMBOL	ORBINC	MACH	PARAMETRIC VALUES
□	- 2.000		1.460 BETA 0.
□	1.000		
◊	4.000		

PATA HIST. CODE 11111

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRP	5.2640	INCHES
YHRF	0.0000	INCHES
ZHMR	0.0330	INCHES
SCALE	0.0074	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 242

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



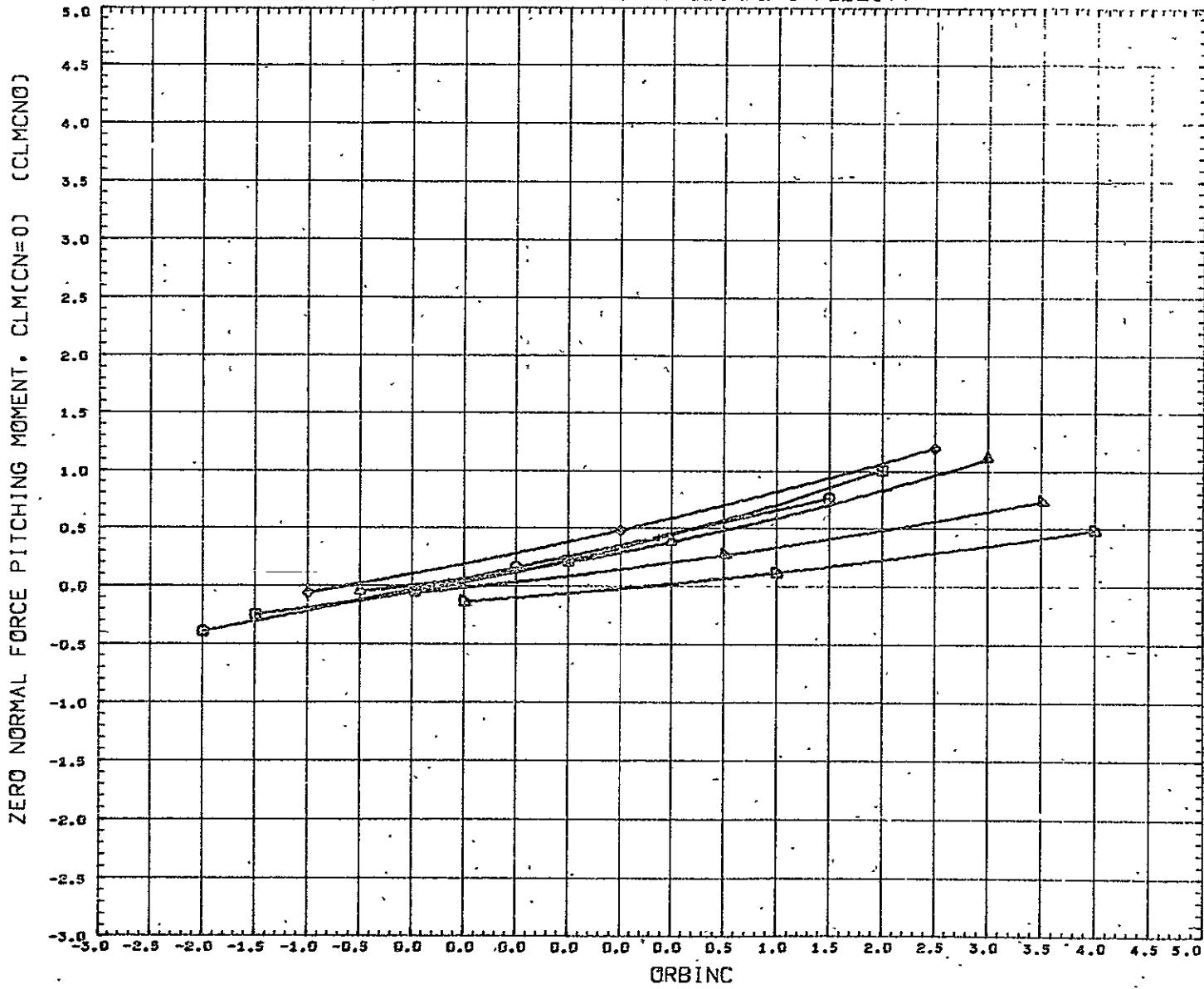
		PARAMETRIC VALUES		
SYMBOL	ORDINC	HACH.	1.960	BETA
<input type="checkbox"/>	- 2.000			0.000
<input type="checkbox"/>	1.000			
<input checked="" type="checkbox"/>	4.000			

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHMRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHMRP	0.0300	INCHES
SCALE	0.0034	

DATA LIST FILE 1

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 [A25081] 14 JAN 71 PAGE 243

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

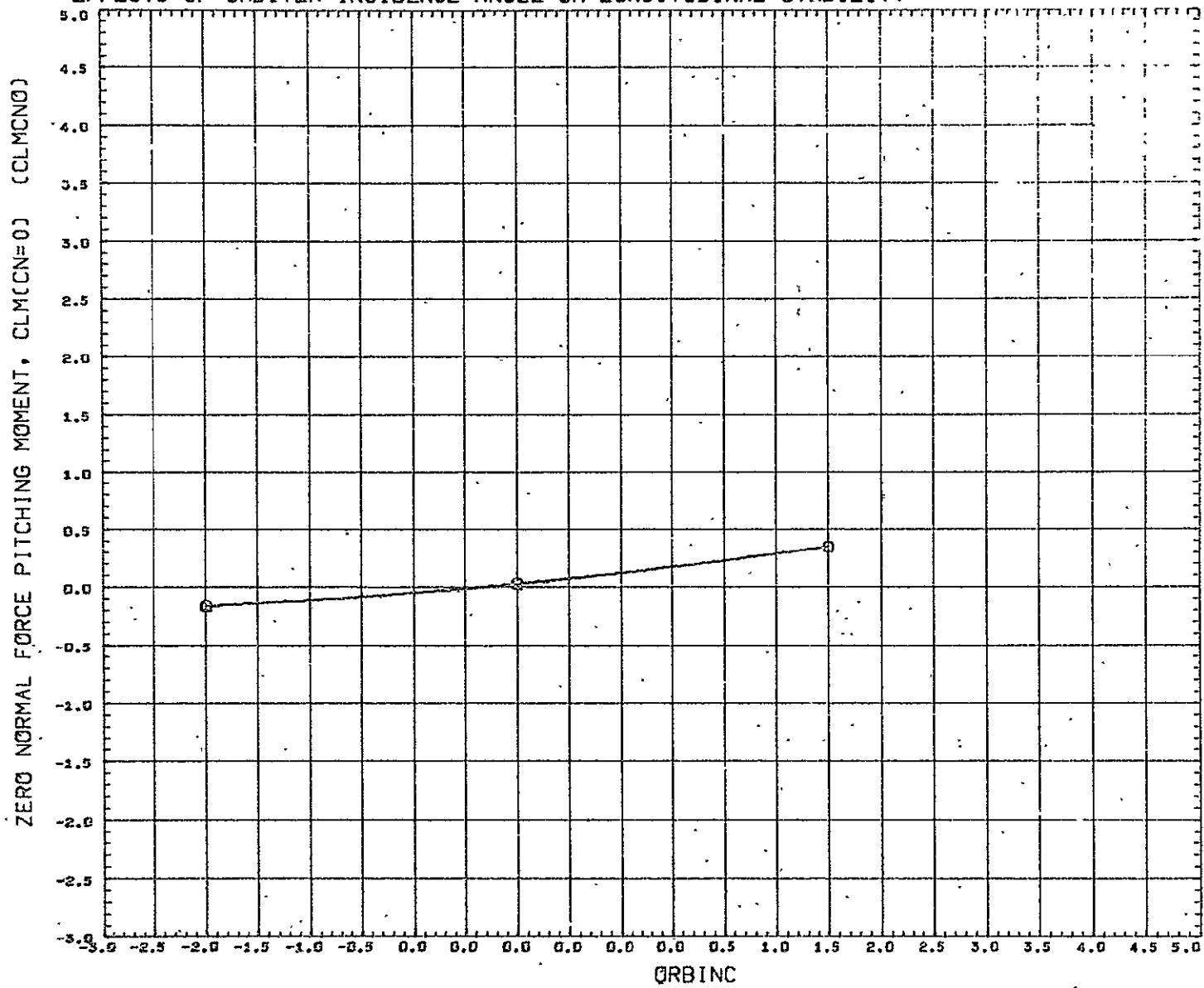


SYMBOL	MACH	BETA	PARAMETRIC VALUES
O	0.600		0.000
D	0.900		
Diamond	1.000		
Delta	1.100		
Delta	1.200		
D	1.460	DATA MIST. CODE	NHIF

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCR0RB/S-ICB00STER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 244

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



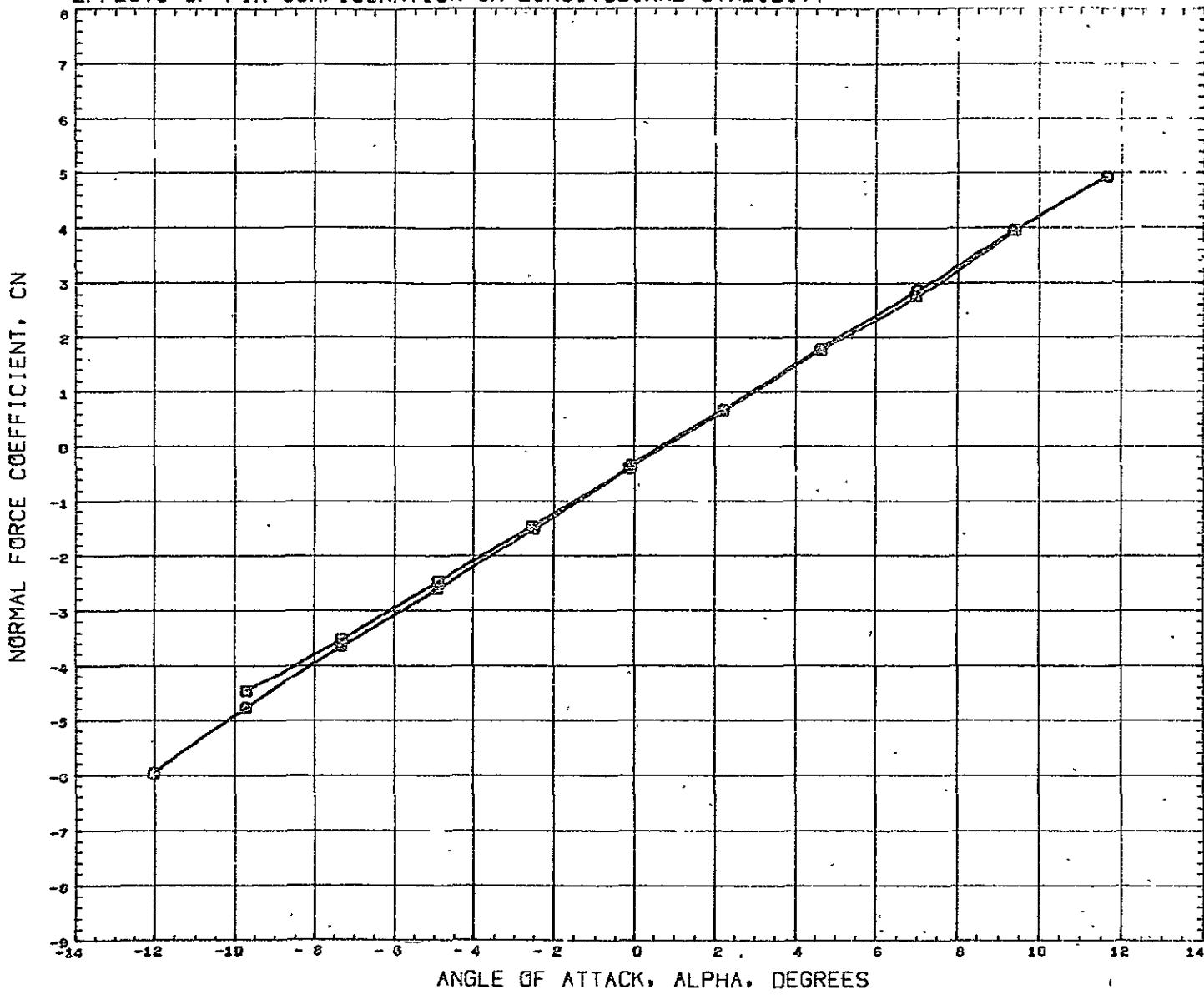
SYMBOL MACH PARAMETRIC VALUES
 ◻ 1.960 BETA 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRP 5.2640 INCHES
 YHRP 0.0000 INCHES
 ZHRP 0.0330 INCHES
 SCALE 0.0034

DATA HIST. CODE NHIF

MSFC 476 NR HCR0RB/S-ICBOOSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 245

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS 1.3960 SQ.IN.

REFL 1.3330 INCHES

REFB 1.3330 INCHES

XHRF 5.2640 INCHES

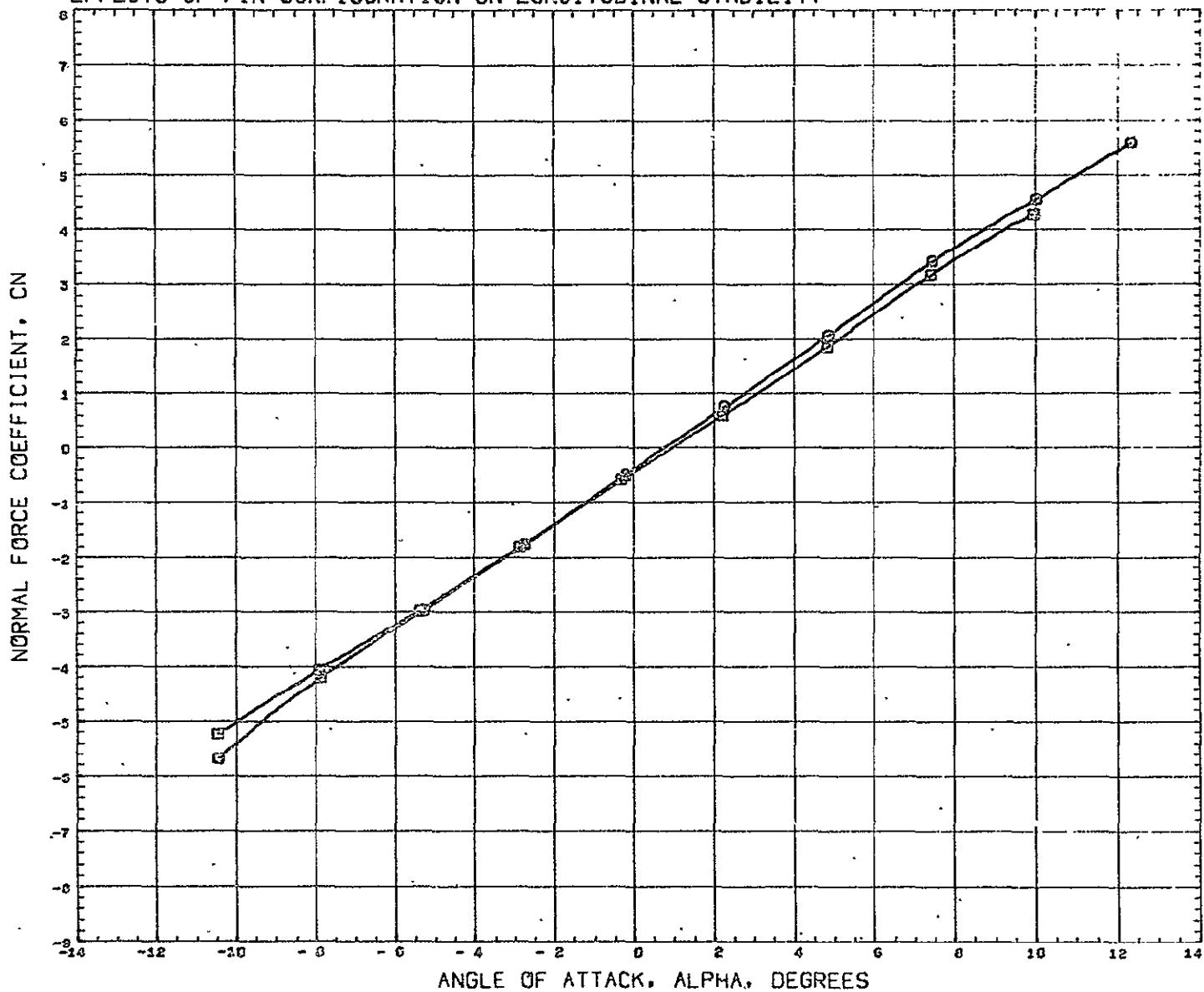
YHRF 0.0000 INCHES

ZHRF 0.0330 INCHES

SCALE 0.0034 INCHES

HACH 0.600

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) □ HSFC 475 MR MCROB/S-ICBOOSTER BF15+B5W14E3V17
 (R23091) □ HSFC 476 MR MCROB/S-ICBOOSTER BF25+B5W14E3V17

PARAMETRIC VALUES

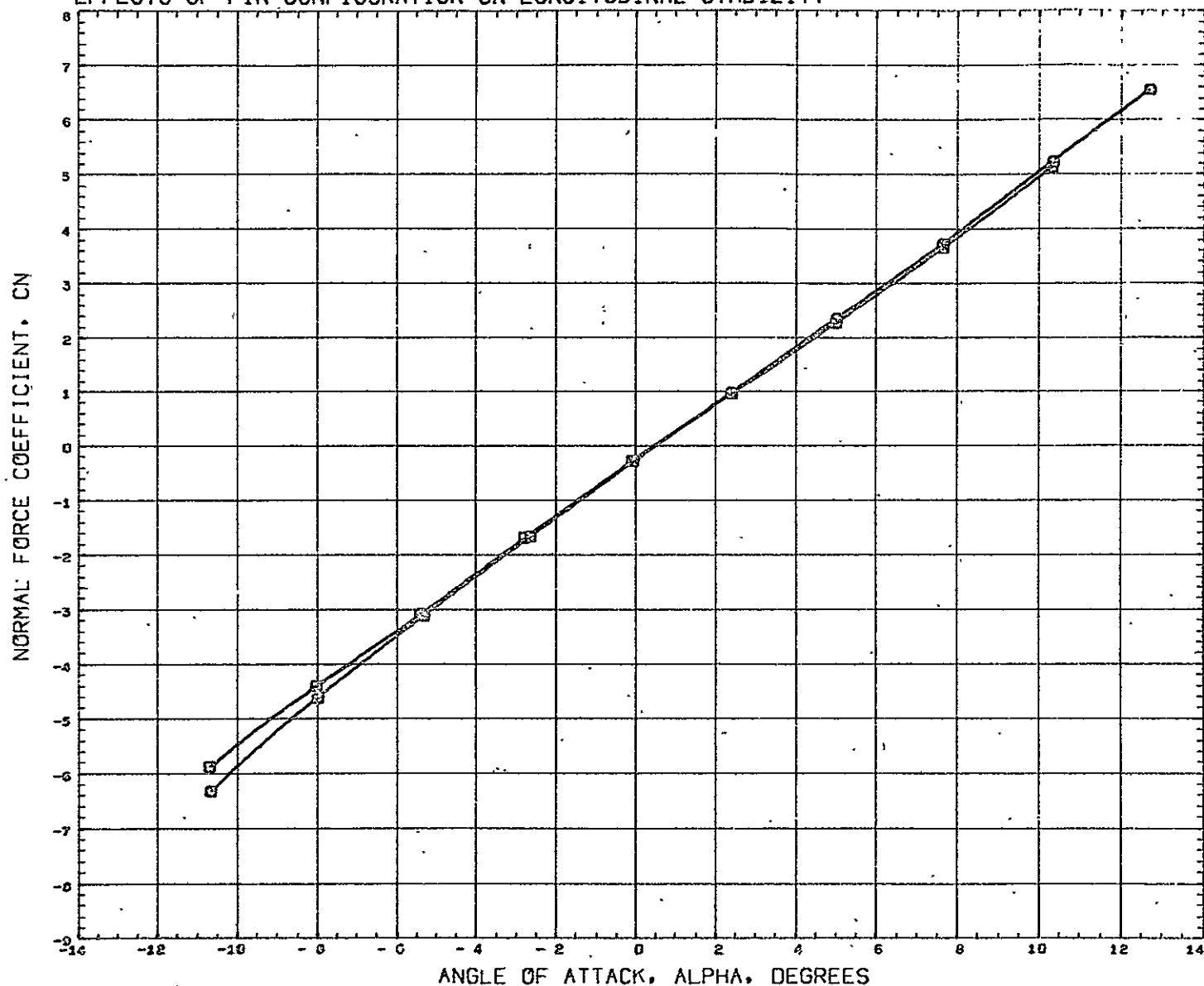
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0350	INCHES
SCALE	0.0034	

MACH 0.098

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+85W14E3V17 BETA

PARAMETRIC VALUES

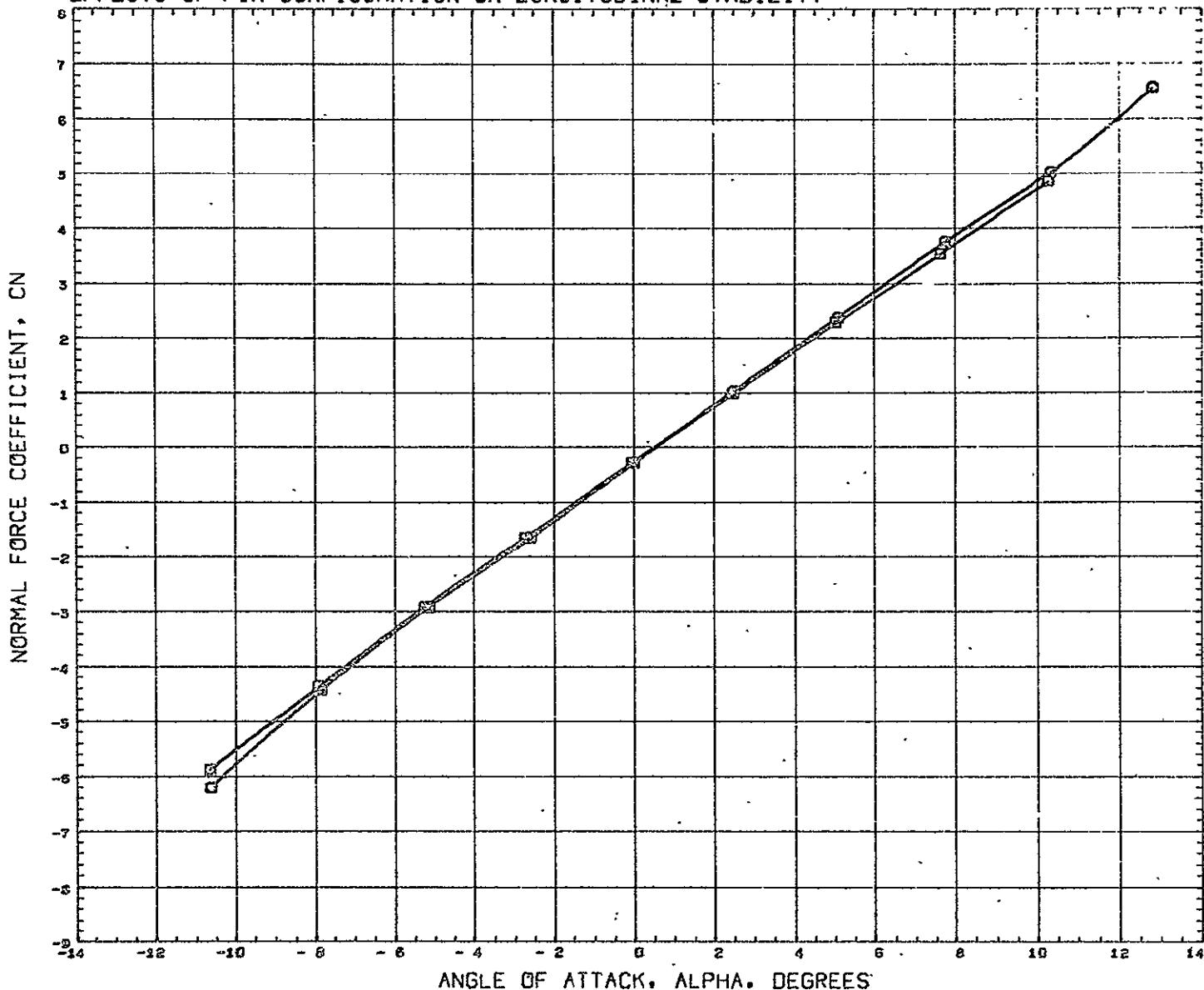
0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.994

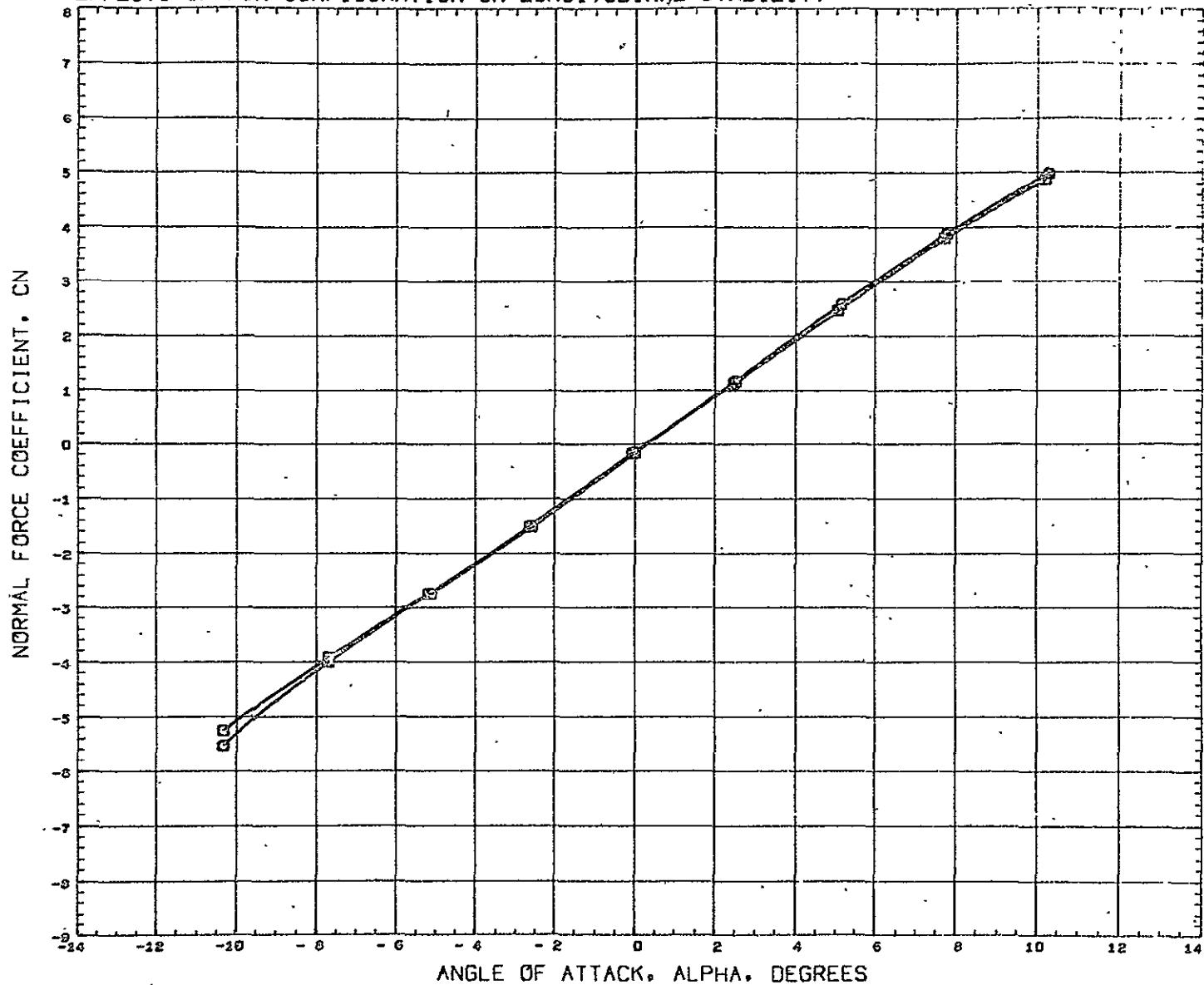
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
(R25021)	MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17	BETA 0.020 ORBINC 1.000	REFS 1.3960 SQ.IN.
(R25091)	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17	REFL 1.3330 INCHES	
		REFB 1.3330 INCHES	
		XHRP 5.2640 INCHES	
		YHRP 0.0000 INCHES	
		ZHRP 0.0330 INCHES	
		SCALE 0.0034	

HACH 1.105

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) \circ HSFC 476 MR HCRORB/S-ICBOOSTER BF1S+BSW14E3V17 BETA

PARAMETRIC VALUES

0.020 ORBINC 1.000

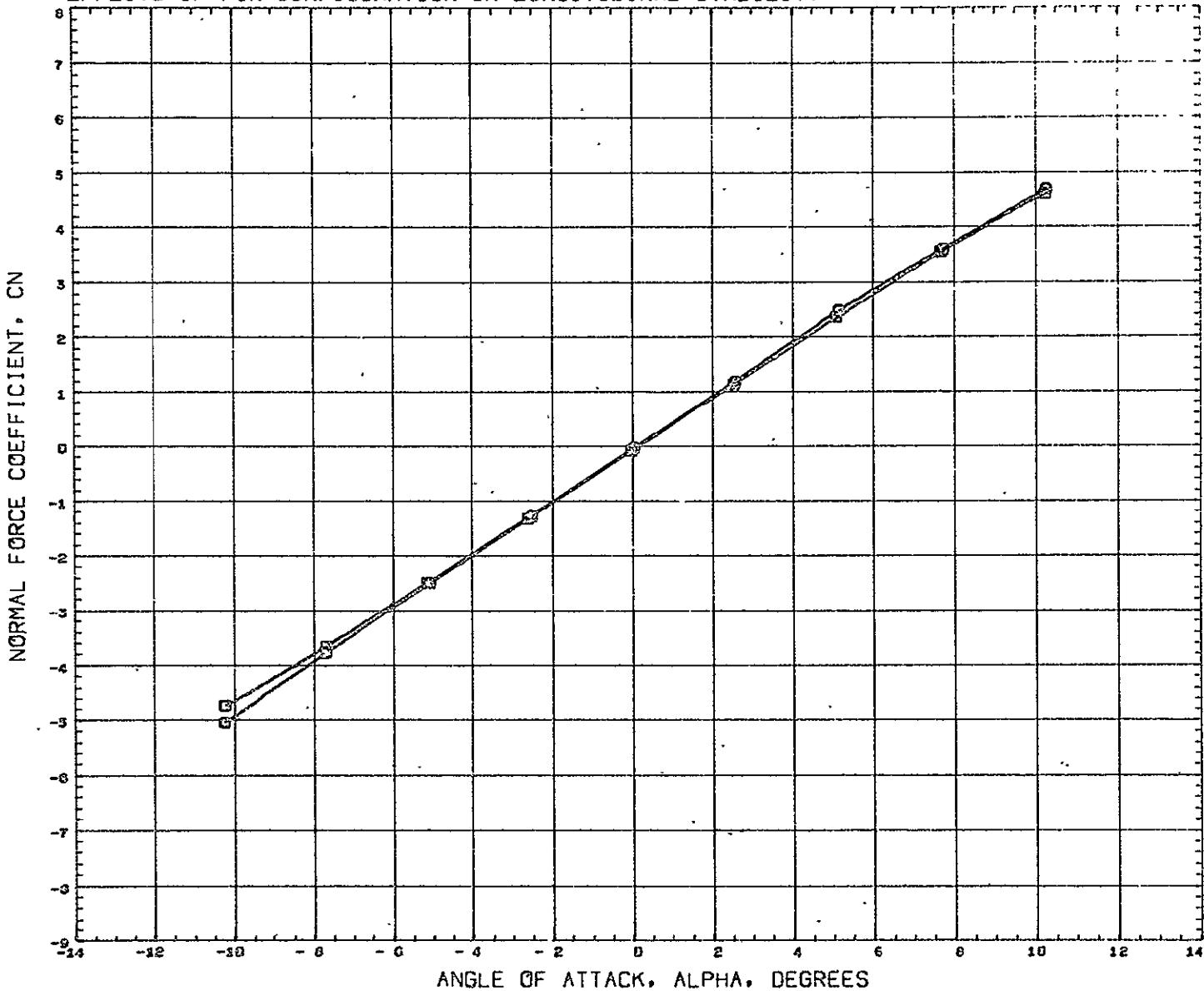
REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) O HSFC 476 NR HCRORB/S-1C BOOSTER BF1S+B5W14E3V17
 (R25091) □ HSFC 476 NR HCRORB/S-1C BOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

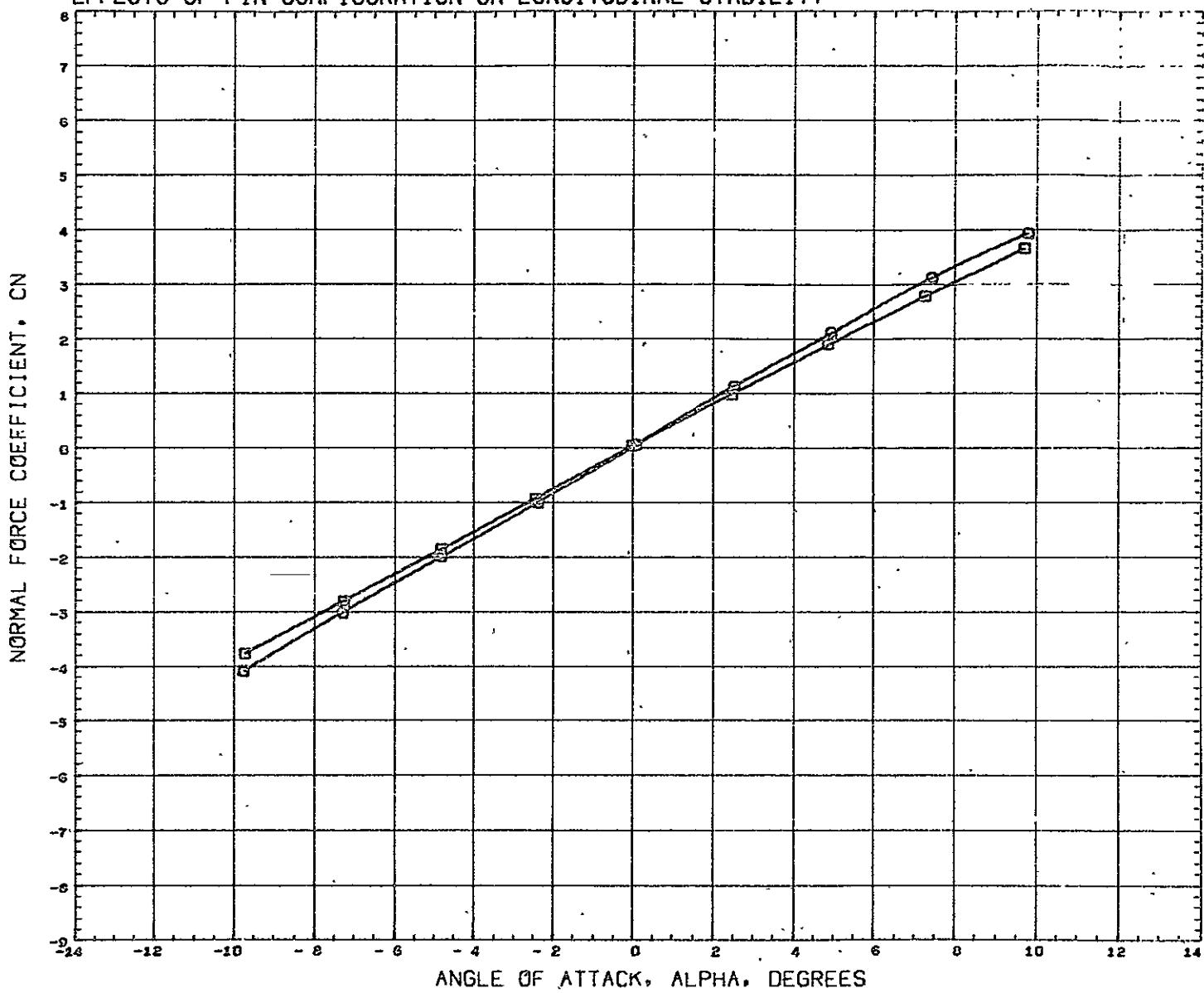
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SG. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.665

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) O MSFC 476 NR HCRORB/S-ICBOOSTER BF15+B5W14E3V17 BETA 0.020 ORBINC 1.000

(R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF25+B5W14E3V17

PARAMETRIC VALUES

REFS 1.3960 SQ.IN.

REFL 1.3330 INCHES

REFB 1.3330 INCHES

XHRF 5.2640 INCHES

YMRP 0.0000 INCHES

ZHRC 0.0330 INCHES

SCALE 0.0034

REFERENCE INFORMATION

REFS 1.3960 SQ.IN.

REFL 1.3330 INCHES

REFB 1.3330 INCHES

XHRF 5.2640 INCHES

YMRP 0.0000 INCHES

ZHRC 0.0330 INCHES

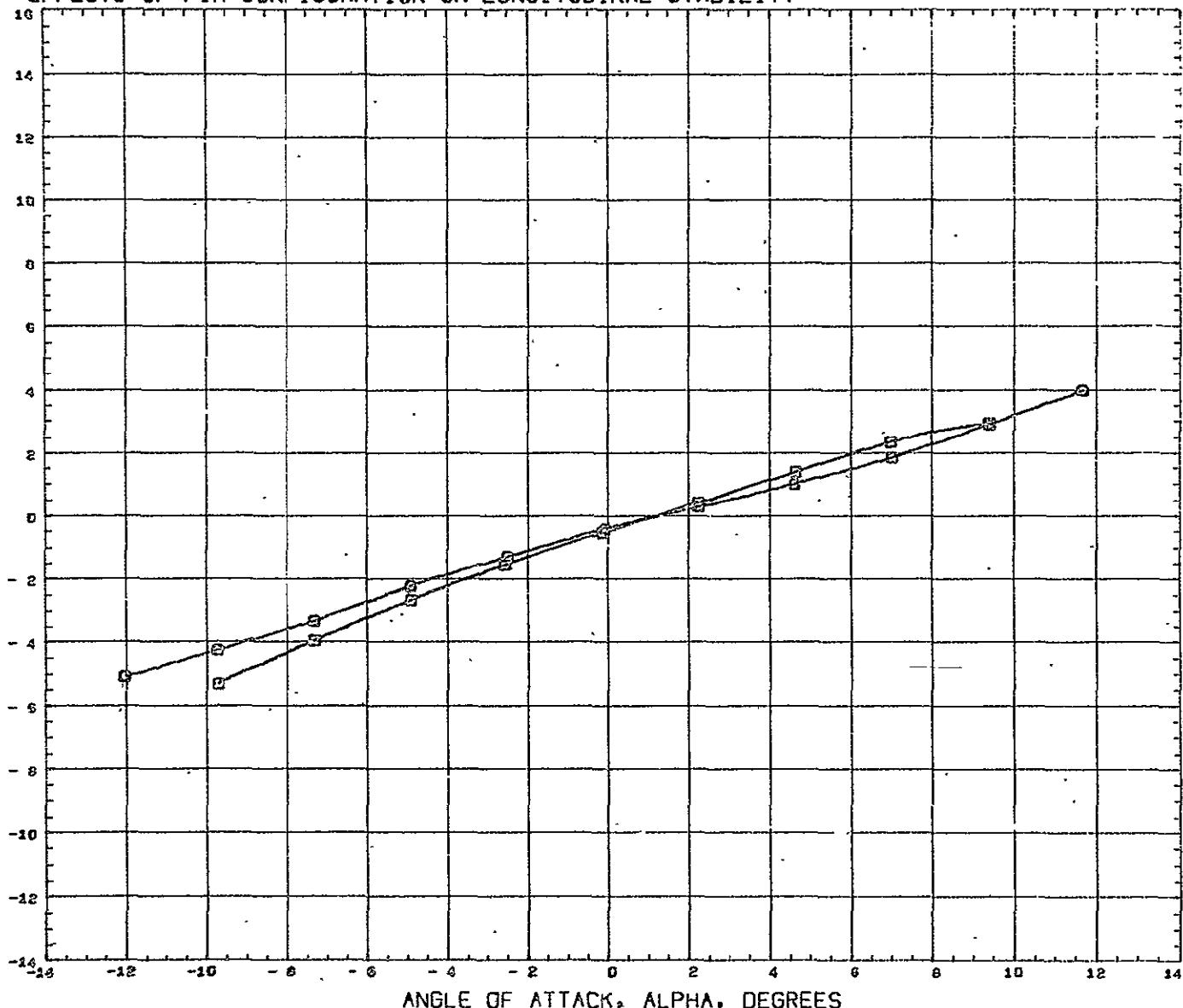
SCALE 0.0034

MACH 1.952

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) O MSFC 476 NR MCROB/S-ICBOOSTER BF1S+85W14E3V17
 (R25091) □ MSFC 476 NR MCROB/S-ICBOOSTER BF2S+85W14E3V17

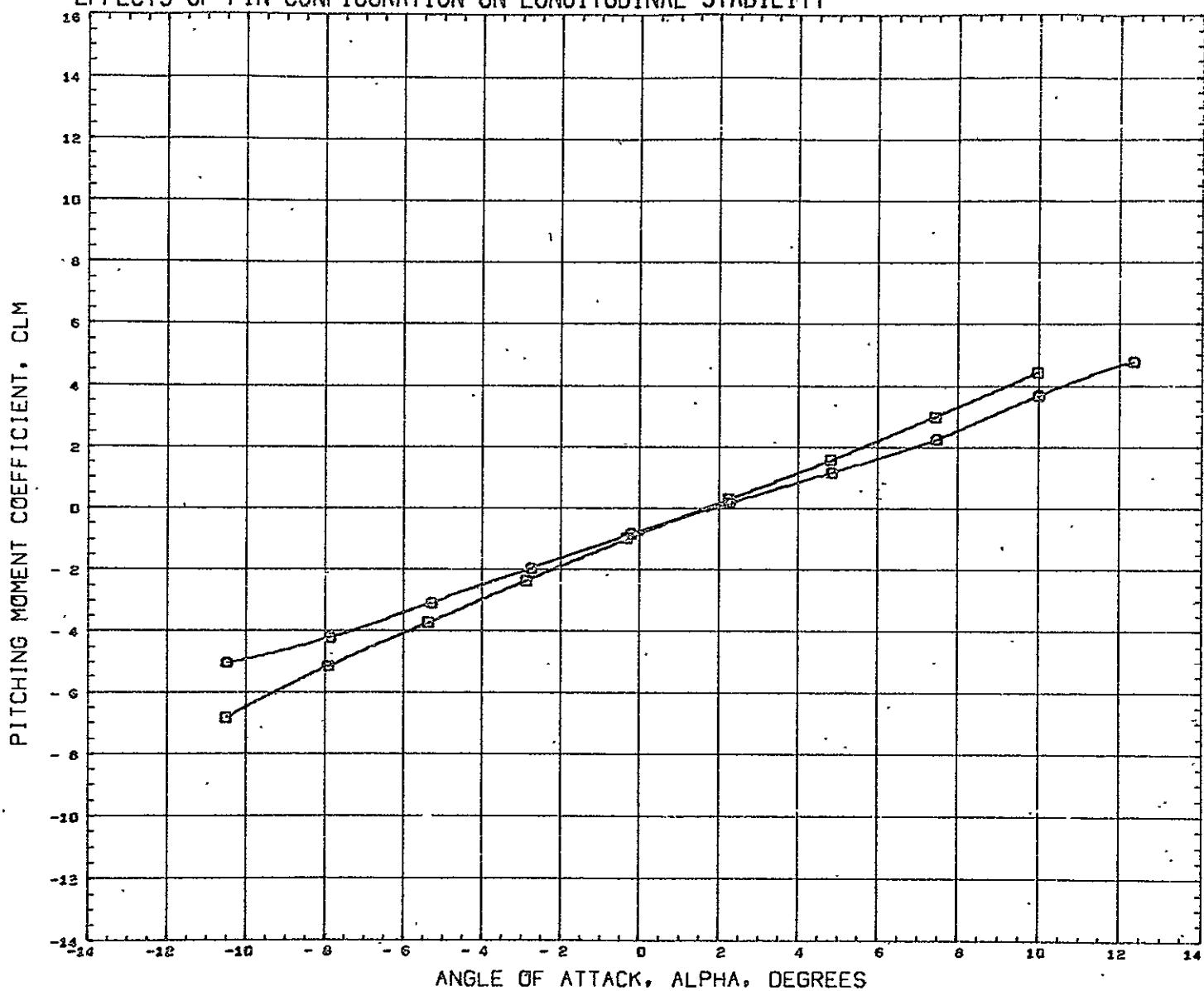
PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION	
REFS 1.3960	SQ. IN.
REFL 1.3330	INCHES
REFB 1.3330	INCHES
XHRF 5.2640	INCHES
YHRF 0.0000	INCHES
ZHRF 0.0330	INCHES
SCALE 0.0034	

MACH 0.600

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

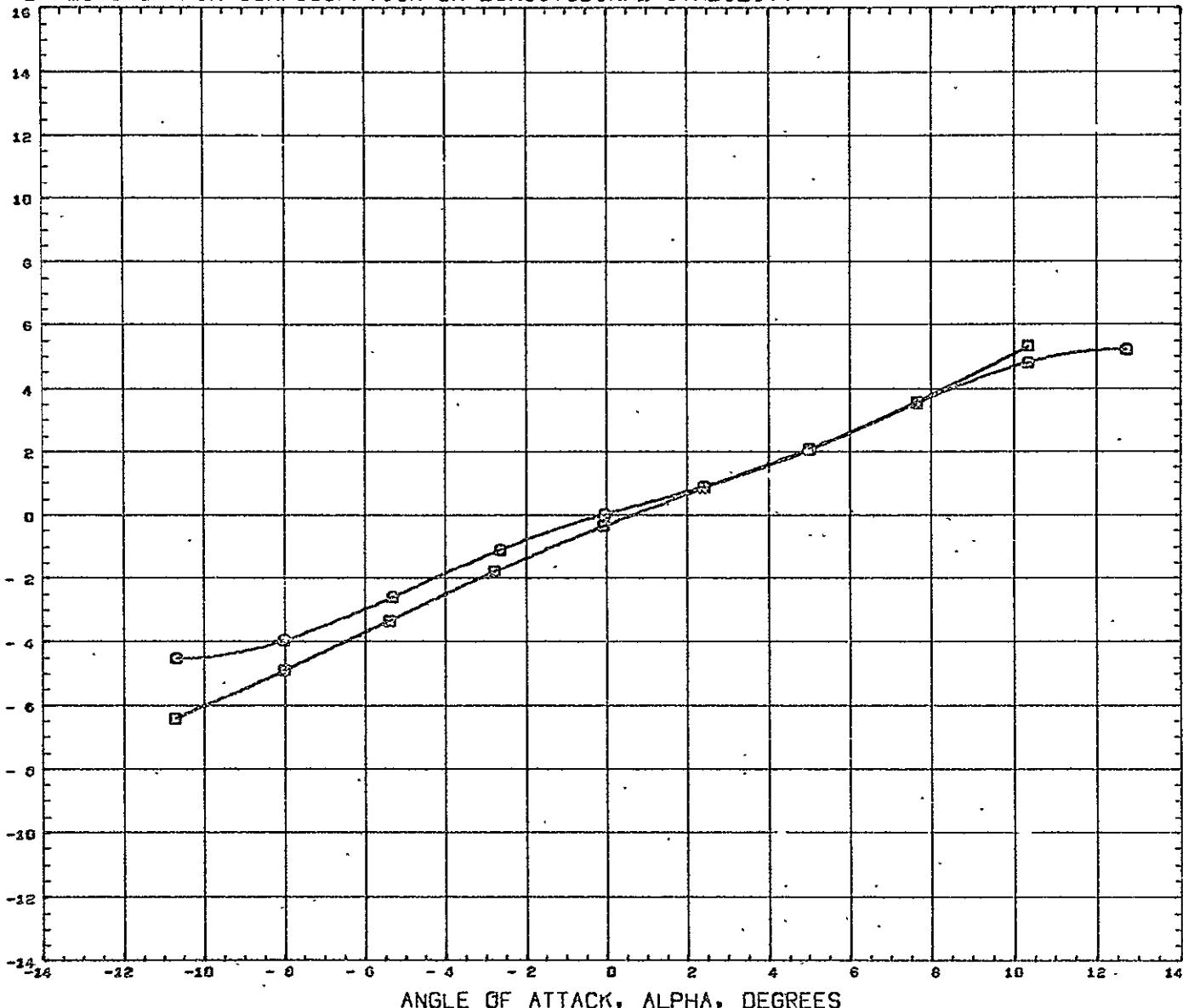
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	INCHES

MACH 0.698

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



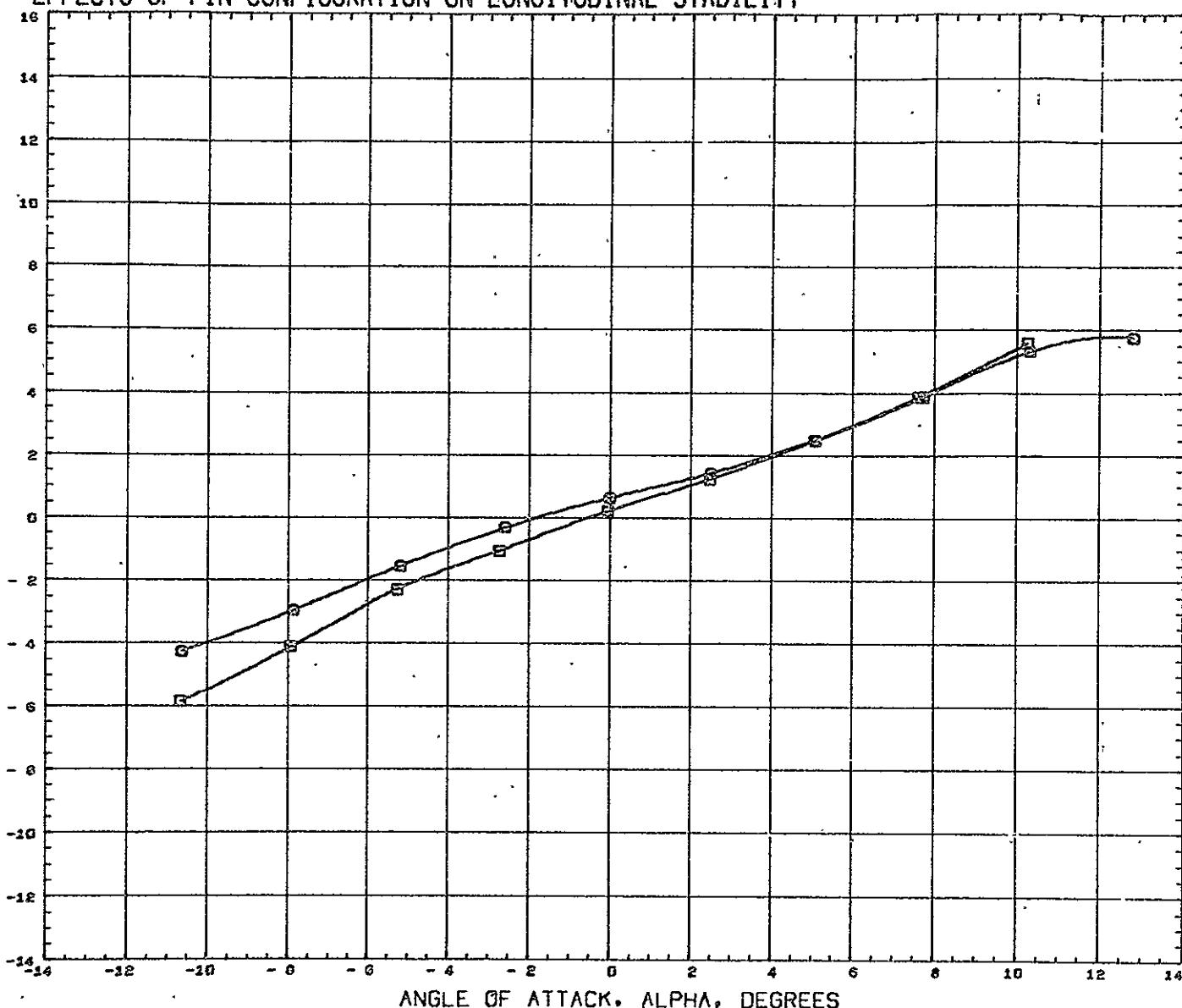
DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
(R25021)	O HSFC 476 NR HCRORBS-ICBOOSTER BF15+B5W14E3V17	BETA 0.020 ORBINC 1.000	REFS 1.3960 SQ.IN.
(R25091)	□ HSFC 476 NR HCRORBS-1CBOOSTER BF2S+B5W14E3V17		REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XHRF 5.2640 INCHES
			YHRF 0.0000 INCHES
			ZHRF 0.0330 INCHES
			SCALE 0.0034

MACH 0.994

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) O MSFC 475 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

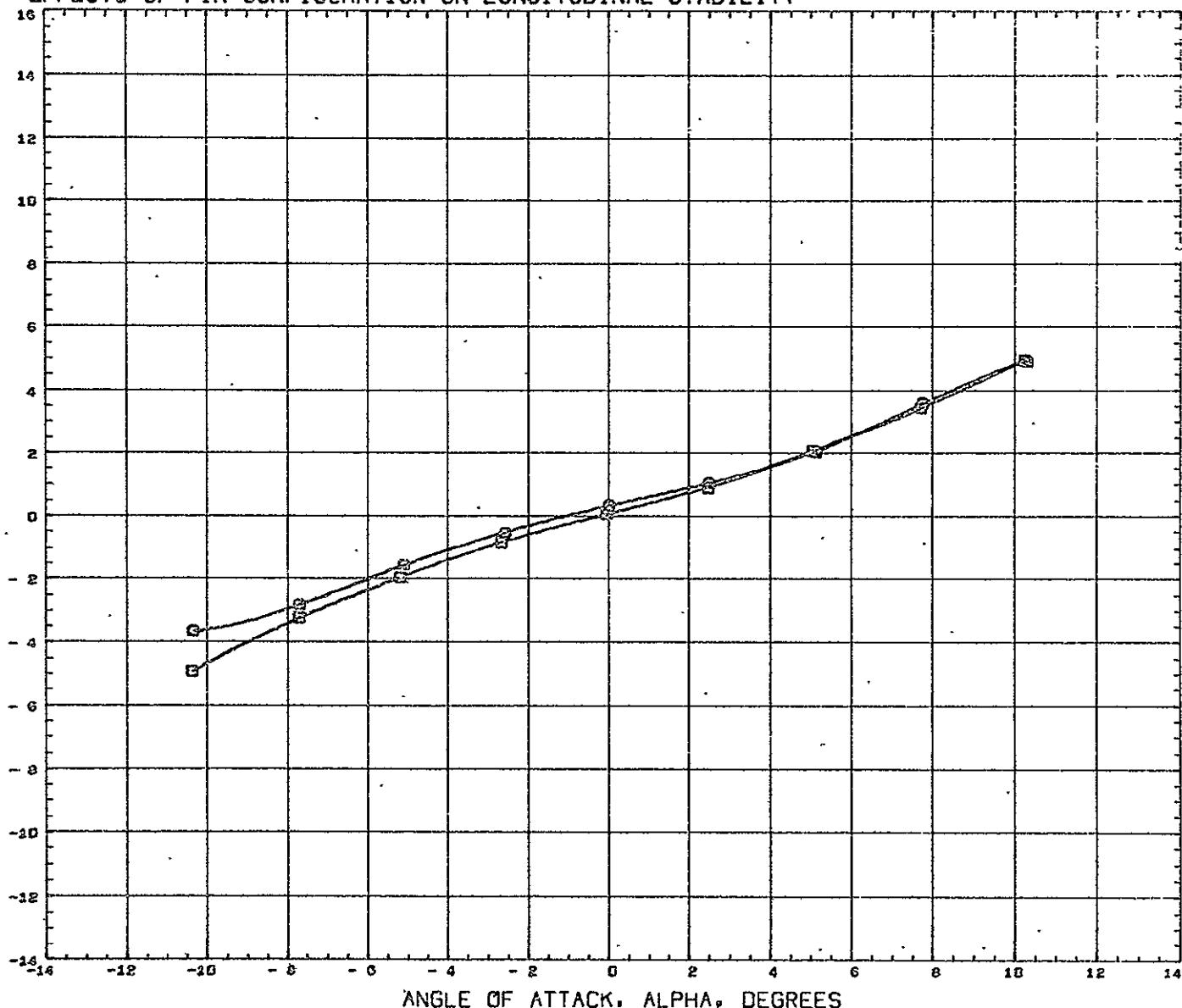
REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XNRP	5.2640	INCHES
YNRP	0.0000	INCHES
ZNRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.105

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



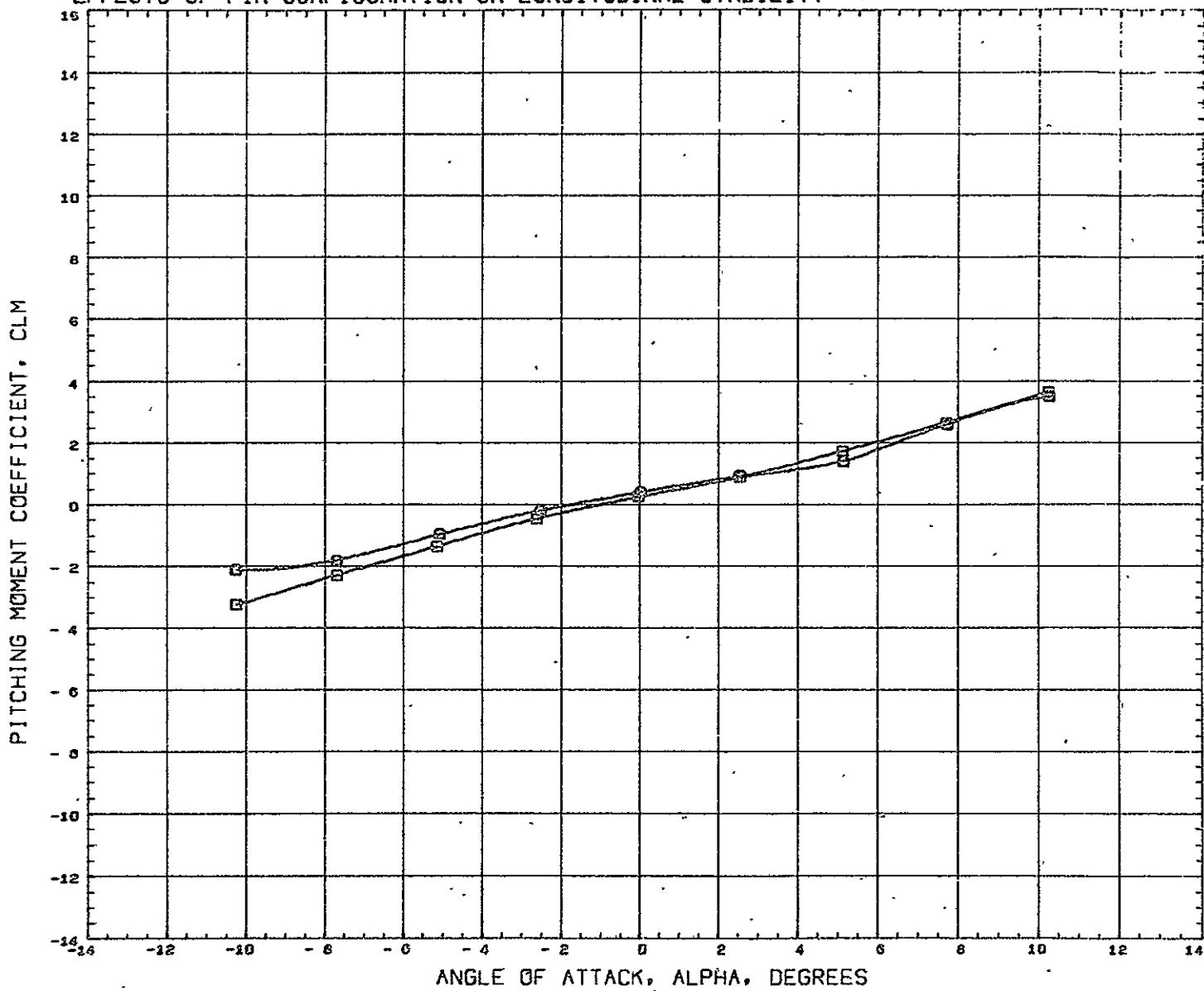
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) HSFC 476 NR HCRORB/S-JCBOOSTER BF1S+B5W14E3V17
 (R25021) NSFC 476 NR HCRORB/S-JCBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES	REFERENCE INFORMATION
BETA 0.020 ORBINC 1.000	REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES	REFB 1.3330 INCHES
XMRP 5.2640 INCHES	YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES	SCALE 0.0034 INCHES

MACH 1.195

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



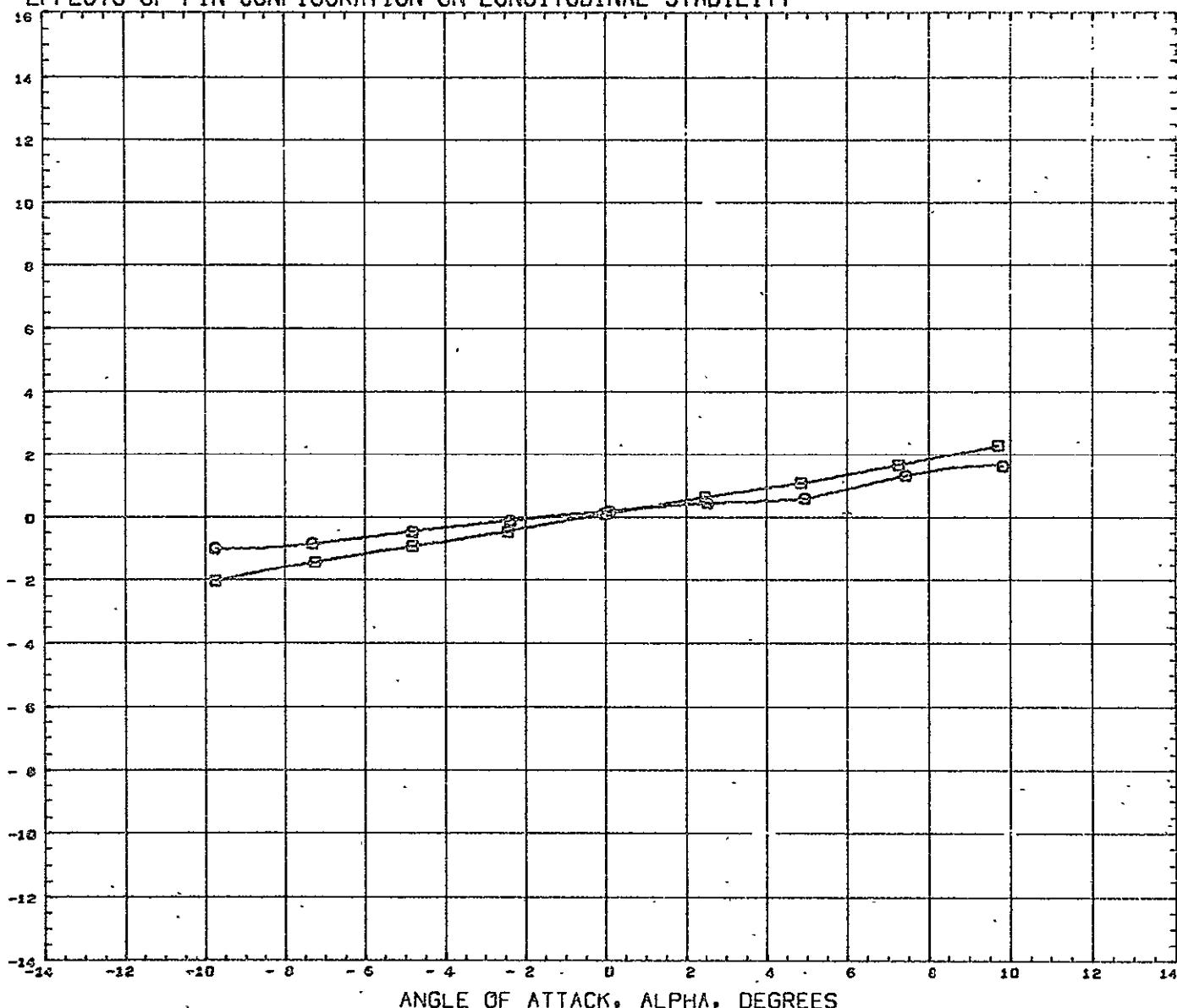
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

	PARAMETRIC VALUES	REFERENCE INFORMATION
BETA:	0.020	REFS 1.3960 SQ.IN.
ORBINC:	1.000	REFL 1.3330 INCHES
ZHRP:		REFB 1.3330 INCHES
XHRF:		XHRF 5.2640 INCHES
YMRF:		YMRF 0.0000 INCHES
ZHRC:		ZHRC 0.0330 INCHES
SCALE:	0.0034	SCALE 0.0034

HACH 1.465

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) O MSFC 476 MR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ MSFC 476 MR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

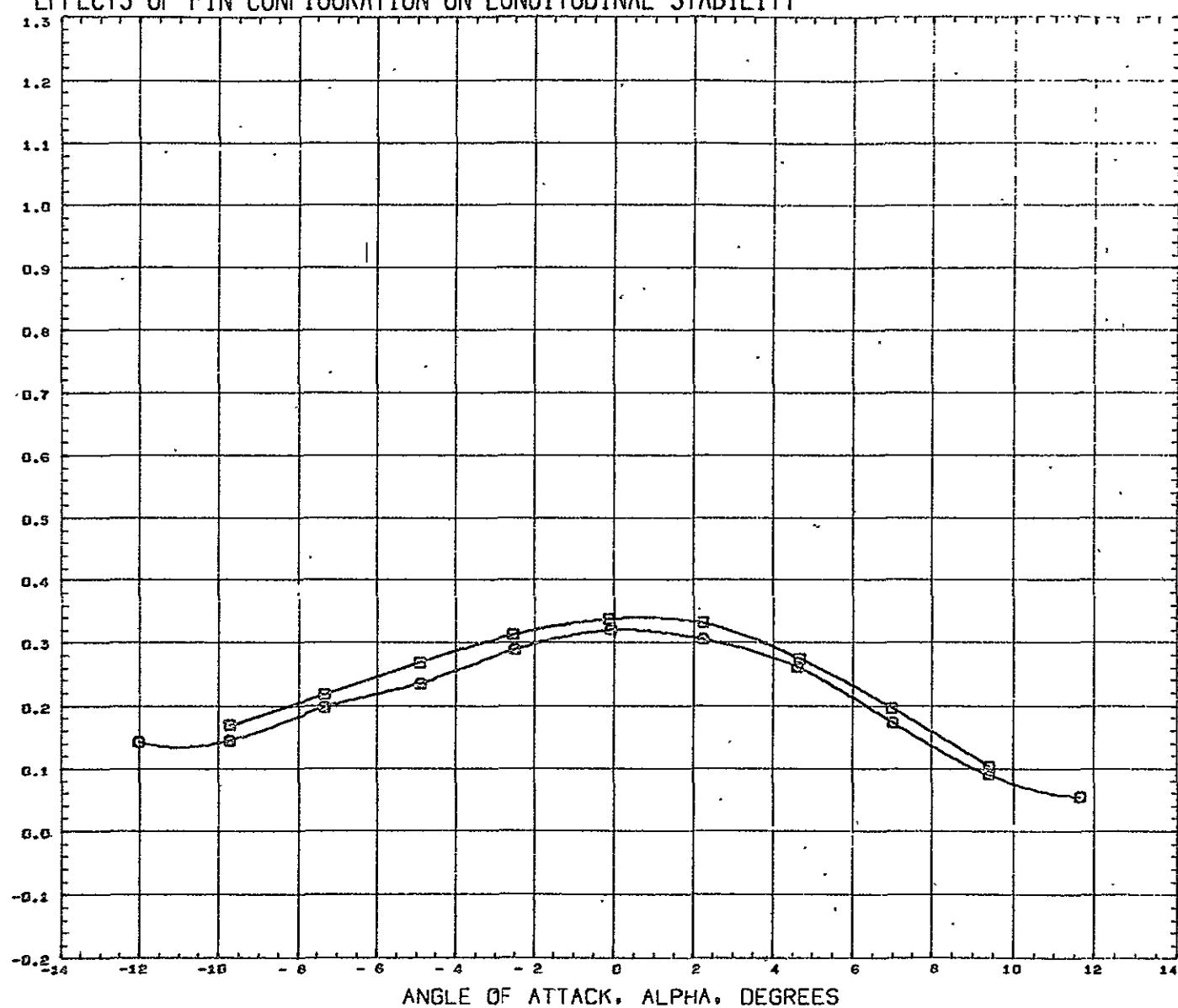
REFERENCE	INFORMATION
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REFL	1.3330 INCHES
REF8	1.3330 INCHES
XHRF	5.2640 INCHES
YHRF	0.0000 INCHES
ZHRF	0.0330 INCHES
SCALE	0.0034 INCHES

MACH 1.952

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) O MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

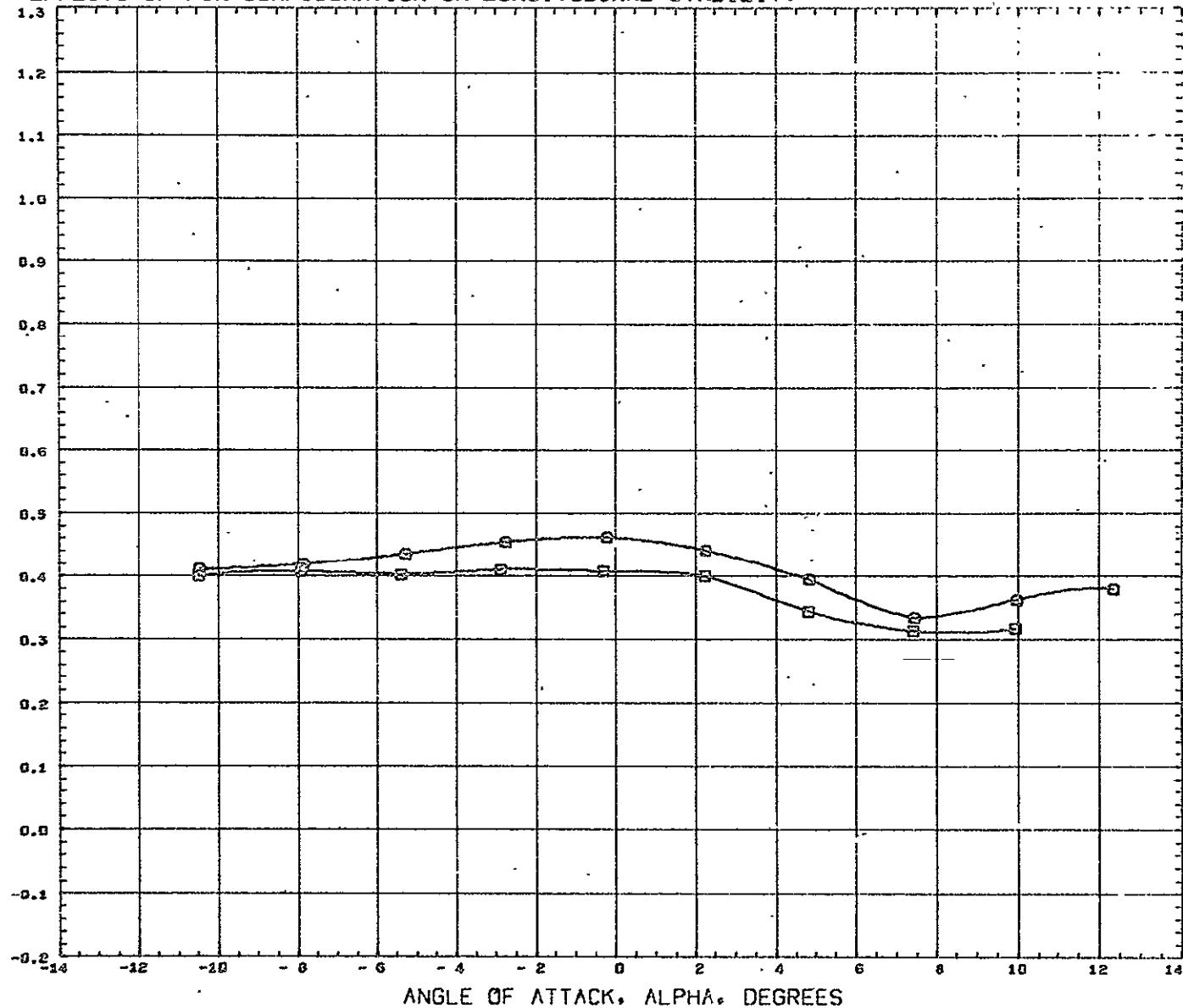
REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 INCHES
REFB 1.3330 INCHES
XMRP 5.2640 INCHES
YMRP 0.0000 INCHES
ZMRP 0.0330 INCHES
SCALE 0.0034

MACH 0.600

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FOREBODY AXIAL FORCE COEFFICIENT, CAF

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

0.020 ORBINC 1.000

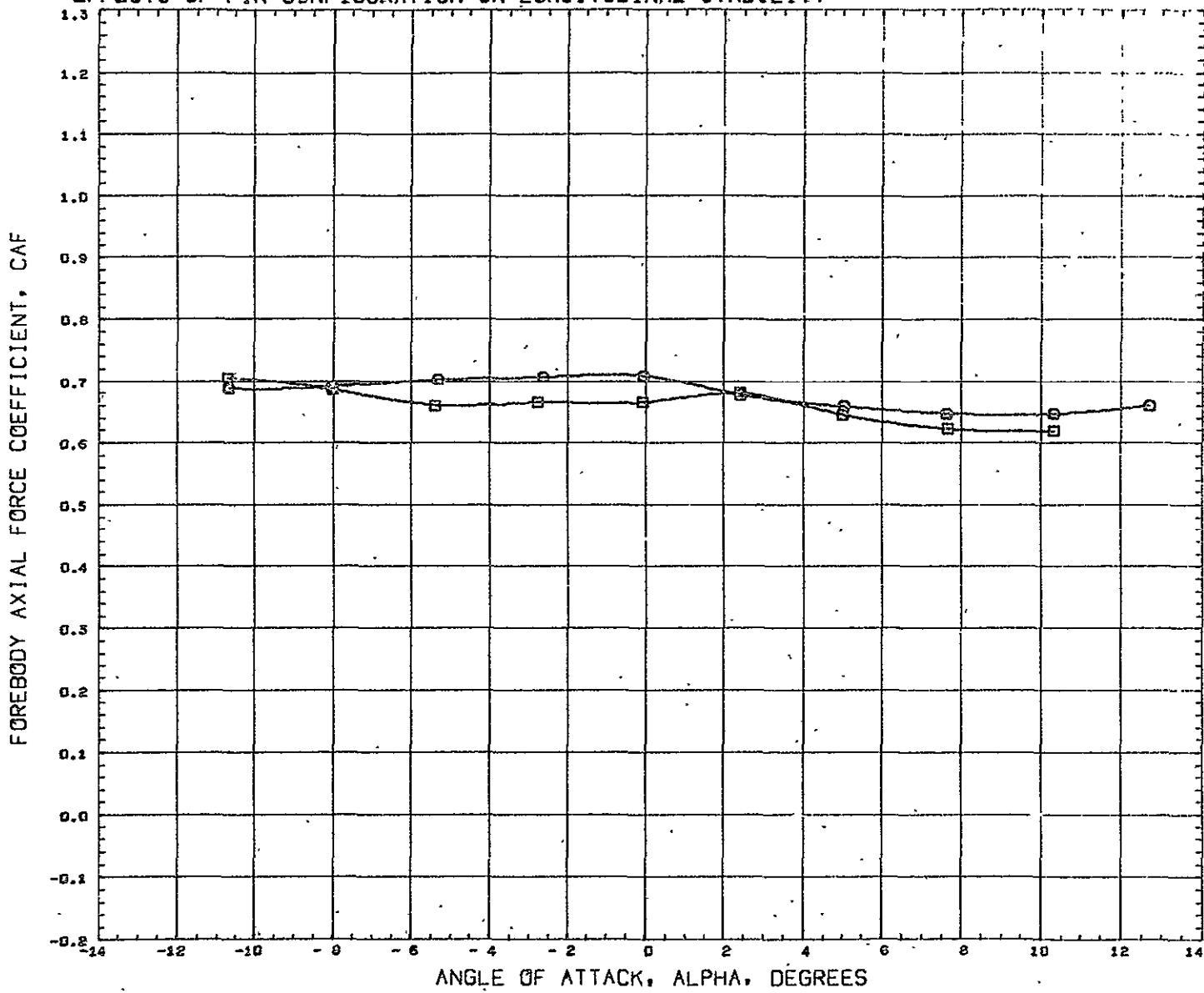
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.698

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25091) MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

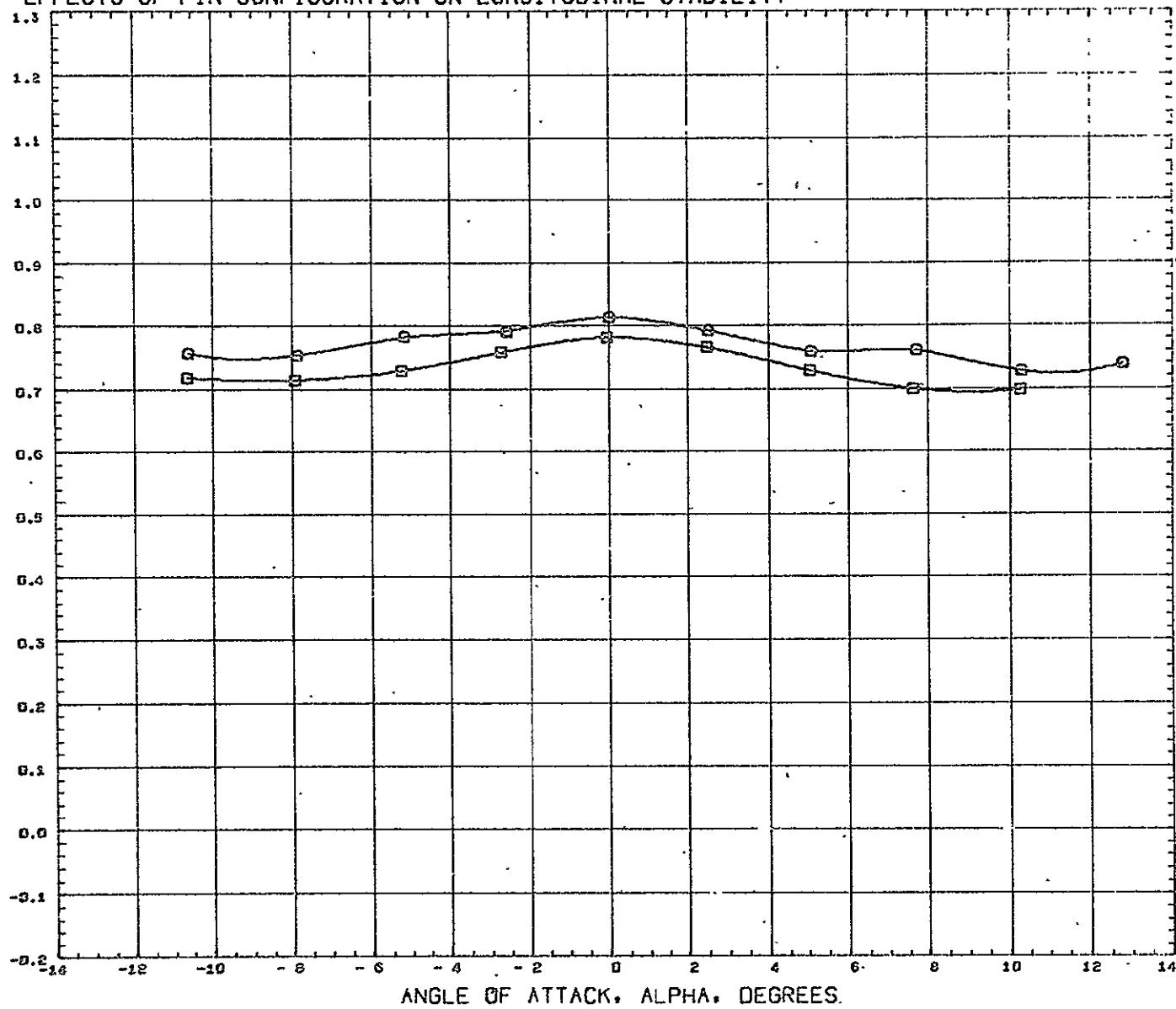
PARAMETRIC VALUES

0.020	ORBINC	\$1.000	REFS.	1.3960	SQ. IN.
			REFL	1.3330	INCHES
			REFB	1.3330	INCHES
			XHRP	5.2640	INCHES
			YMRP	0.0000	INCHES
			ZHRP	0.0330	INCHES
			SCALE	0.0034	

MACH 0.994

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



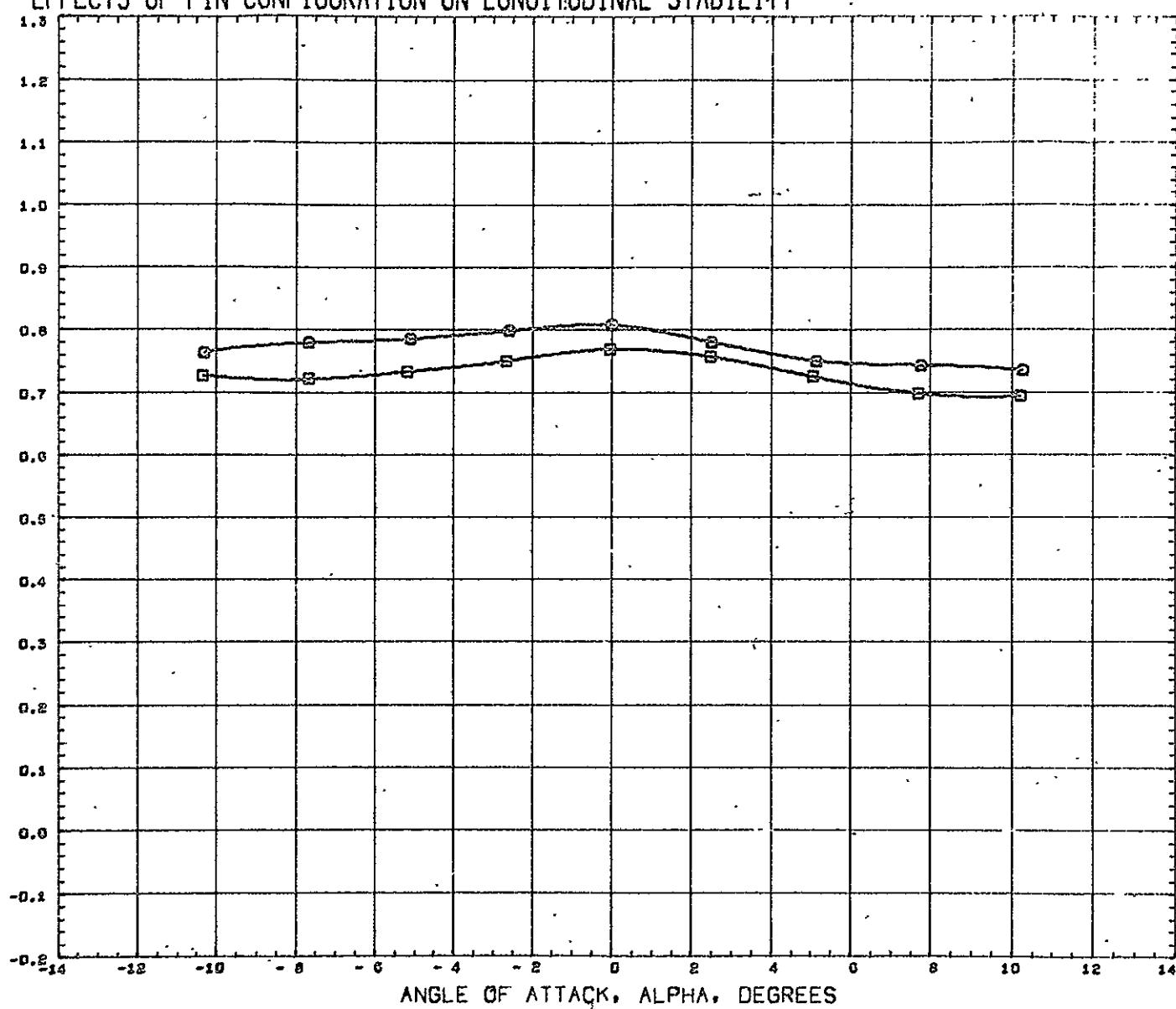
DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION
(R25021)	○ MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17	BETA 0.020 ORBINC 1.000	REFS 1.3960 SQ.IN.
(R25091)	□ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17		REFL 1.3330 INCHES
			REFB 1.3330 INCHES
			XHRF 5.2640 INCHES
			YHRF 0.0000 INCHES
			ZHRF 0.0330 INCHES
			SCALE 0.0034

MACH 1.106

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

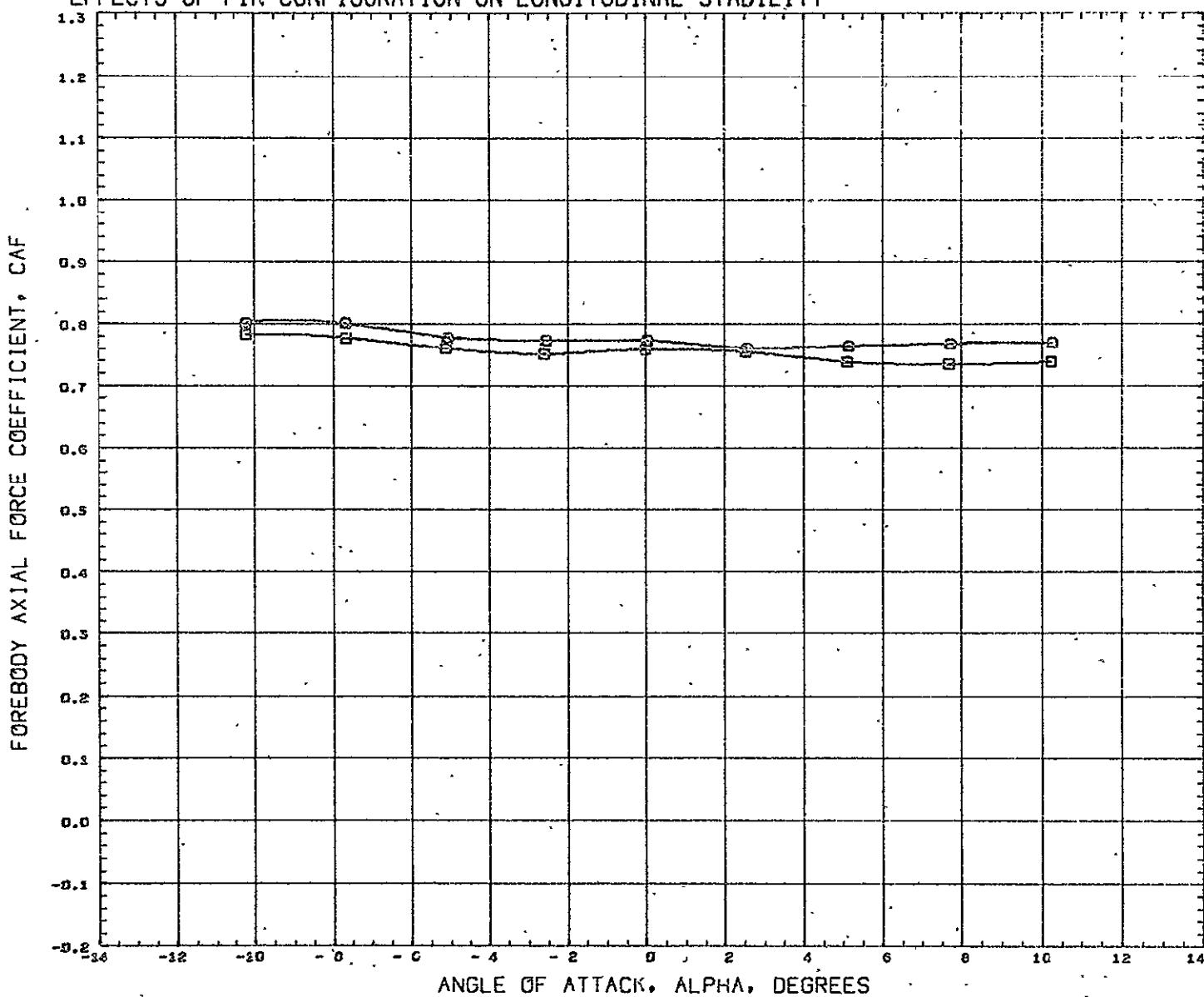
PARAMETRIC VALUES

	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
					REFL	1.3330	INCHES
					REFB	1.3330	INCHES
					XHRF	5.2640	INCHES
					YHRF	0.0000	INCHES
					ZHRF	0.0330	INCHES
					SCALE	0.0034	

MACH 1.198

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

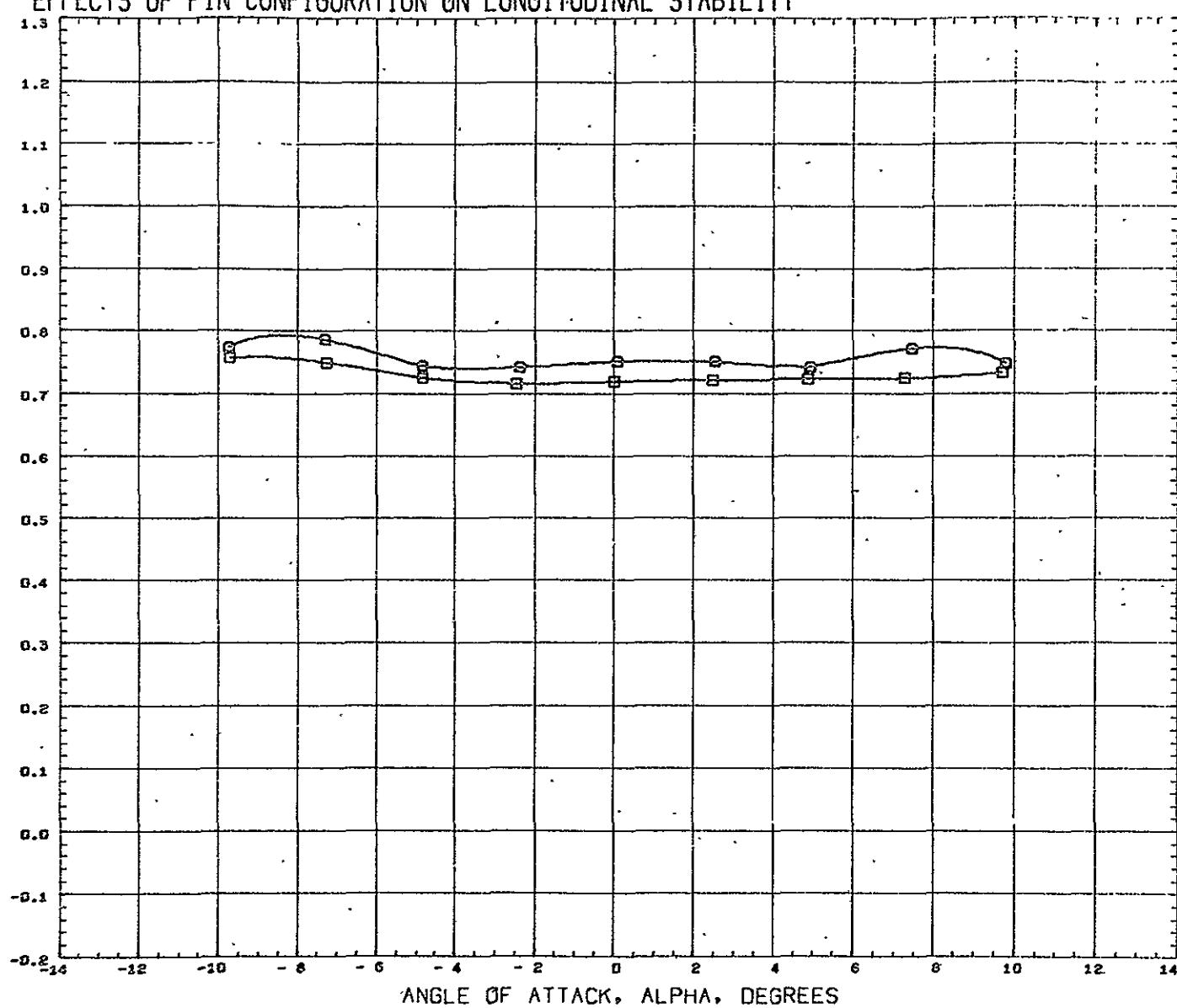


DATA SET SYMBOL CONFIGURATION DESCRIPTION PARAMETRIC VALUES REFERENCE INFORMATION
 (R25021) NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B3W14E3V17 BETA 0.020 ORBINC 1.000 REFS 1.3960 SQ.IN.
 (R25091) NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B3W14E3V17 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YHRF 0.0000 INCHES
 ZHRF 0.0330 INCHES
 SCALE 0.0034

MACH 1.465

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

FOREBODY AXIAL FORCE COEFFICIENT, CAF



ANGLE OF ATTACK, ALPHA, DEGREES

DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25921) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 BETA
 (R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

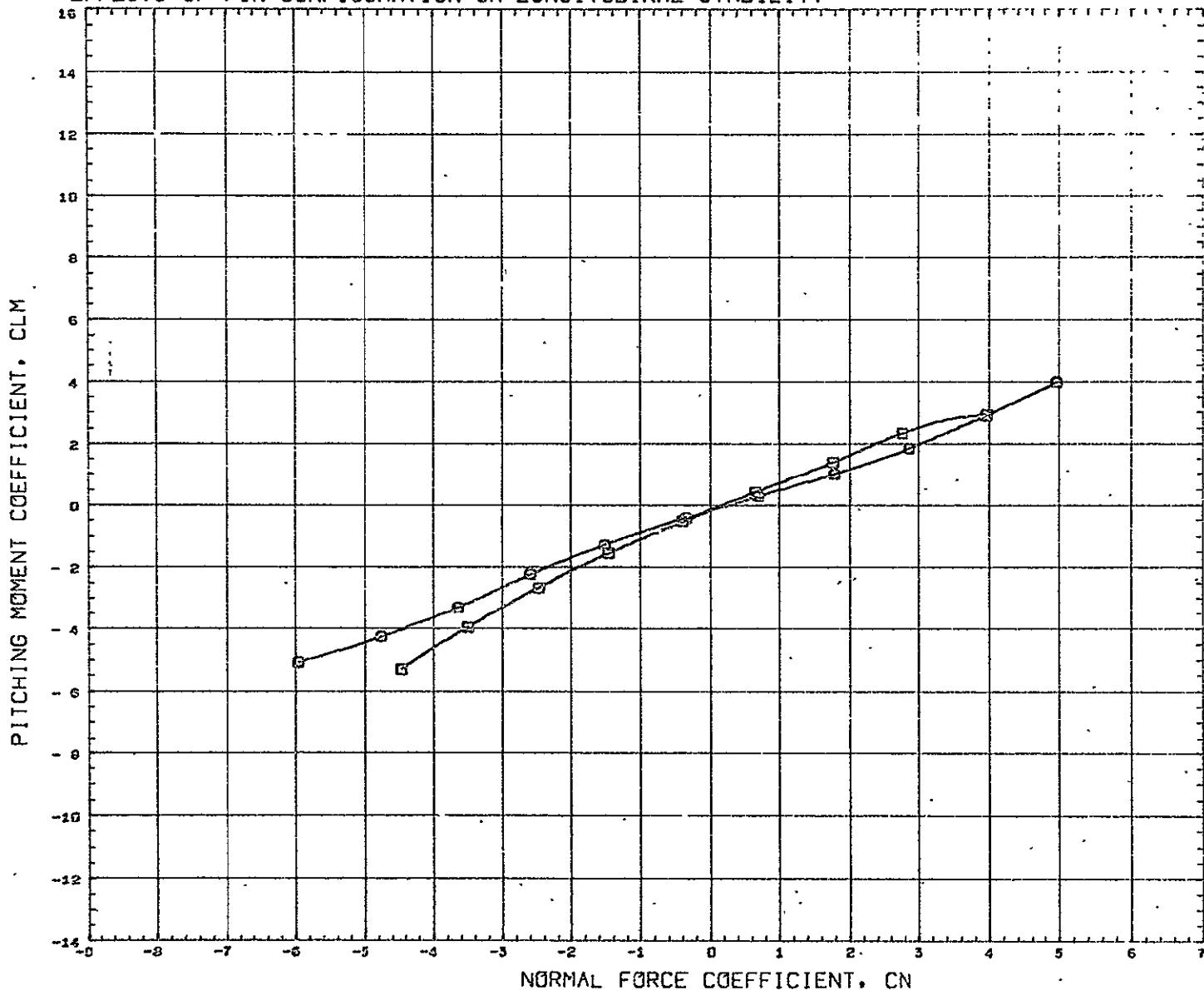
PARAMETRIC VALUES
 0.020 ORBINC 1.000

REFERENCE	INFORMATION
REFS	1.3960 SQ. IN.
REFL	1.3330 INCHES
REFB	1.3330 INCHES
XHRP	5.2640 INCHES
YHRP	0.0000 INCHES
ZHRF	0.0330 INCHES
SCALE	0.0034

MACH 1.952

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R25021) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF15+B5W14E3V17

(R25091) \square NSFC 476 NR HCRORB/S-ICBOOSTER BF25+B5W14E3V17

PARAMETRIC VALUES

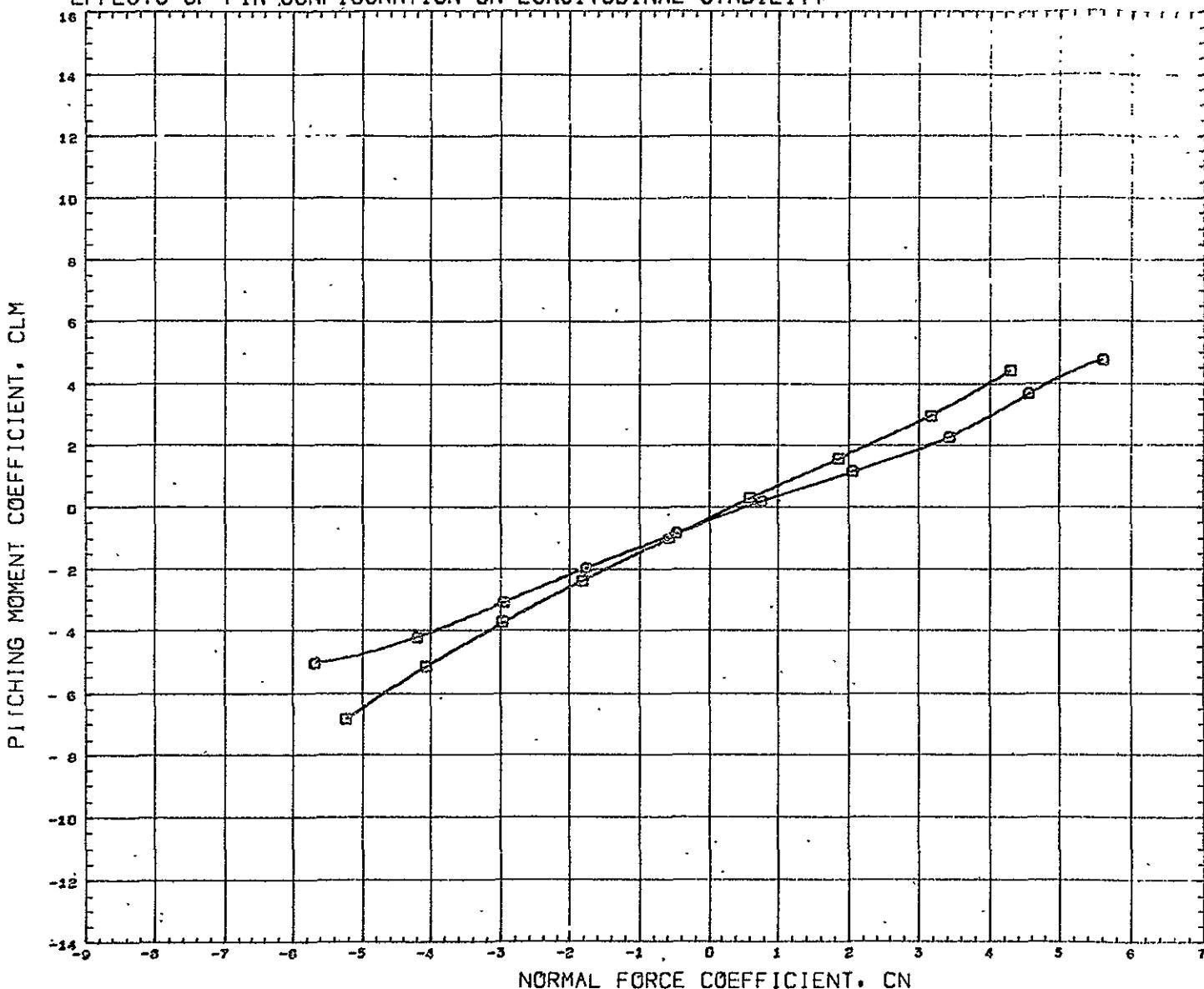
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.600

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

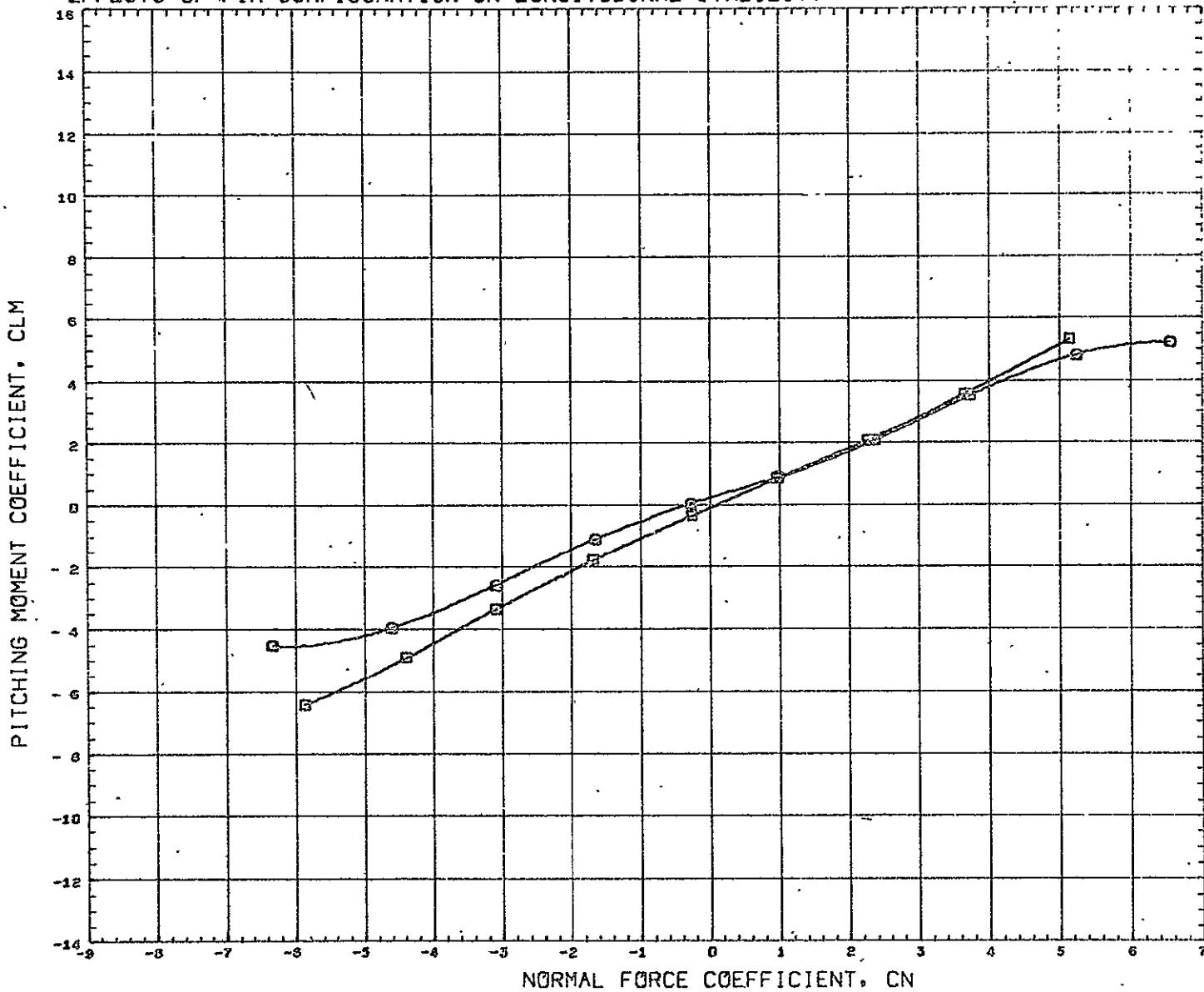
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.896

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

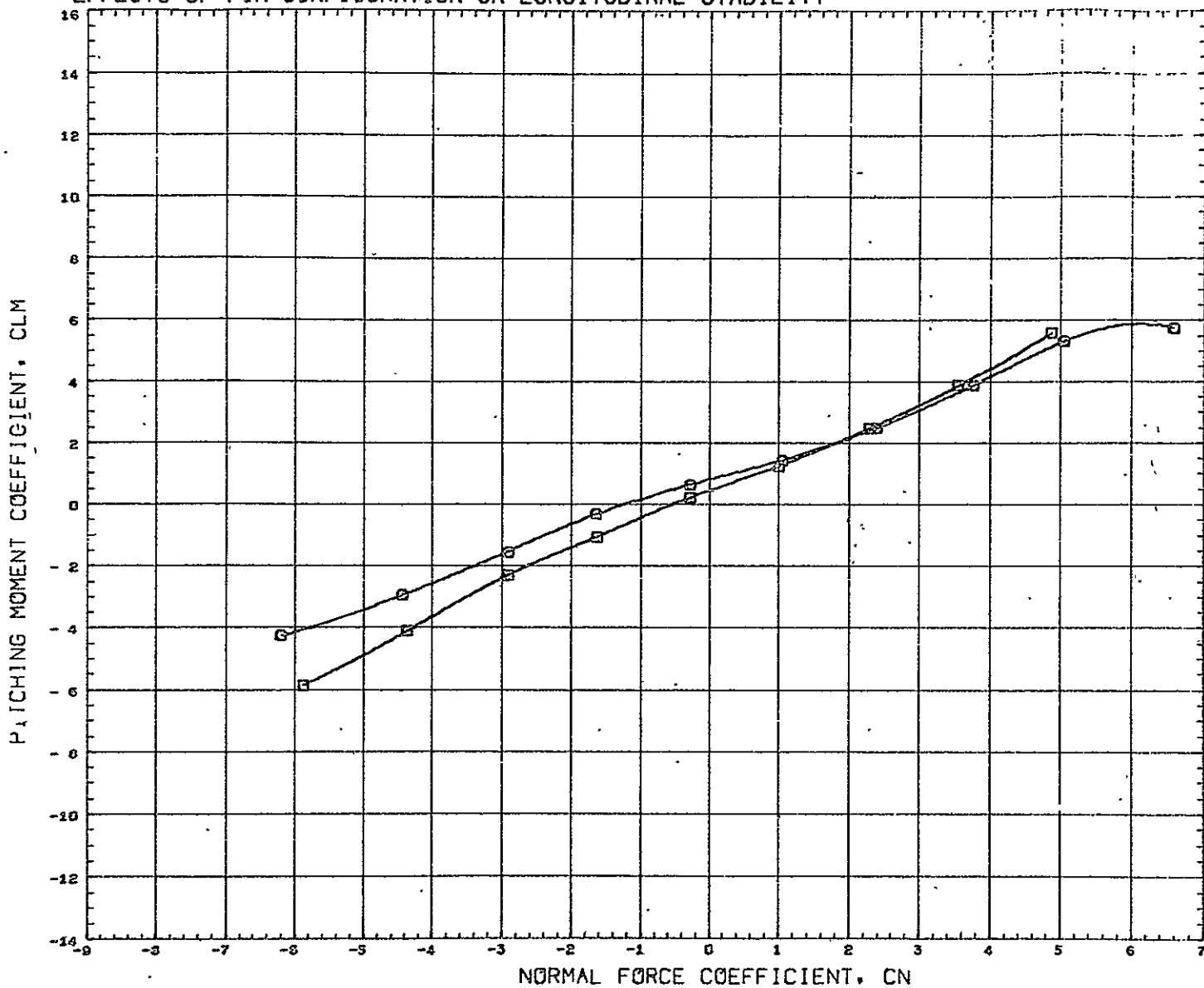


DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) □ NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
 (R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES
 BETA 0.020 ORBINC 1.000
 REF_S 1.3960 SQ.IN.
 REF_L 1.3330 INCHES
 REF_B 1.3330 INCHES
 XHRC 5.2640 INCHES
 YHRC 0.0000 INCHES
 ZHRC 0.0330 INCHES
 SCALE 0.0034

MACH 0.994

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



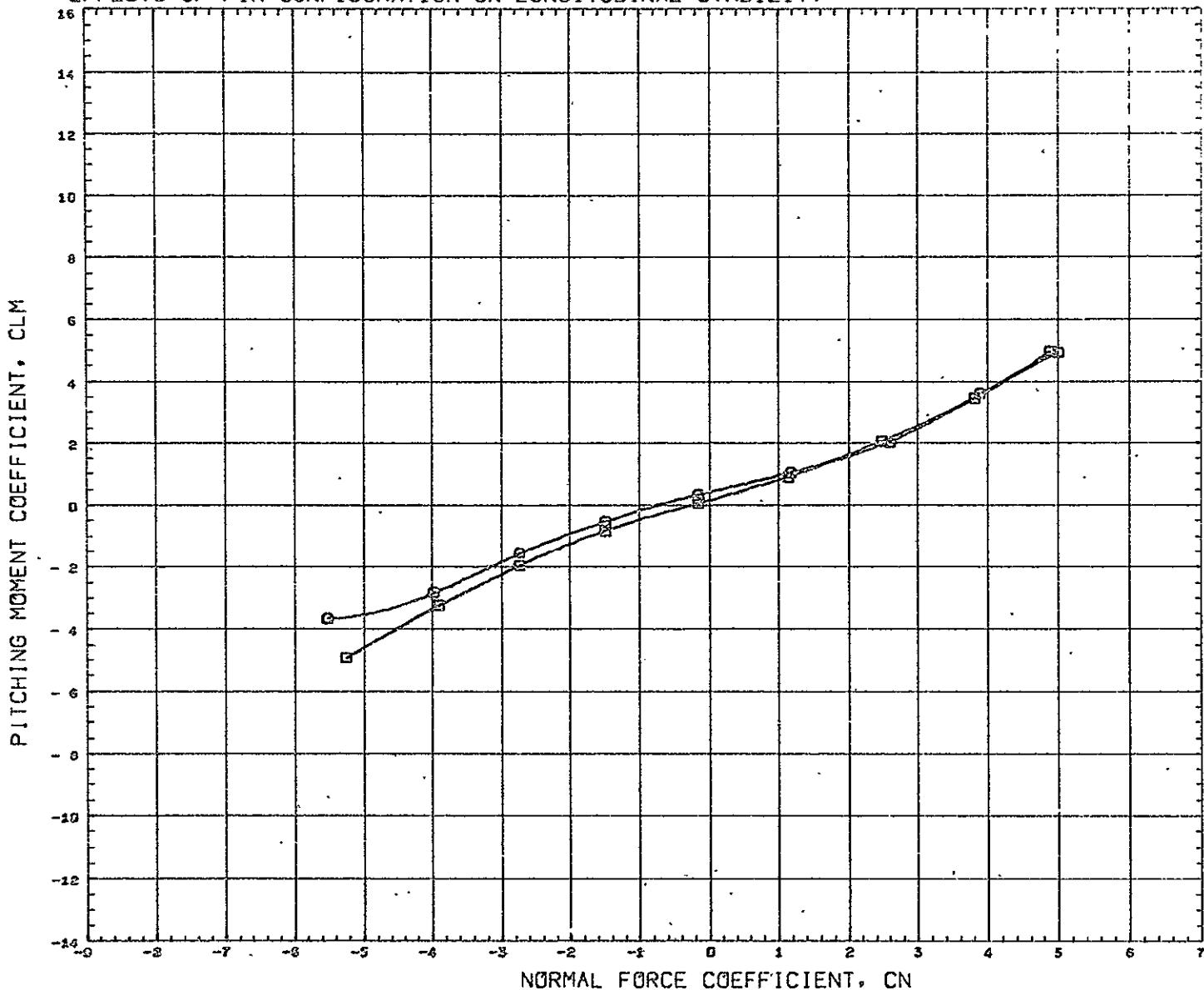
DATA SET SYMBOL CONFIGURATION DESCRIPTION
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 (R25091) □ HSFC 476 NR HCRORB/S-1CBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES REFERENCE INFORMATION
 BETA 0.020 ORBINC 1.000 REFS 1.3960 SQ.IN.
 REFL 1.3330 INCHES
 REFB 1.3330 INCHES
 XHRF 5.2640 INCHES
 YMRF 0.0000 INCHES
 ZMRP 0.0330 INCHES
 SCALE 0.0034

MACH 1.106

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (R25021) MSFC 476 NR HCRORB/S-1ICBOOSTER BF1S+B5W14E3V17
 (R25091) MSFC 476 NR HCRORB/S-1ICBOOSTER BF2S+B5W14E3V17

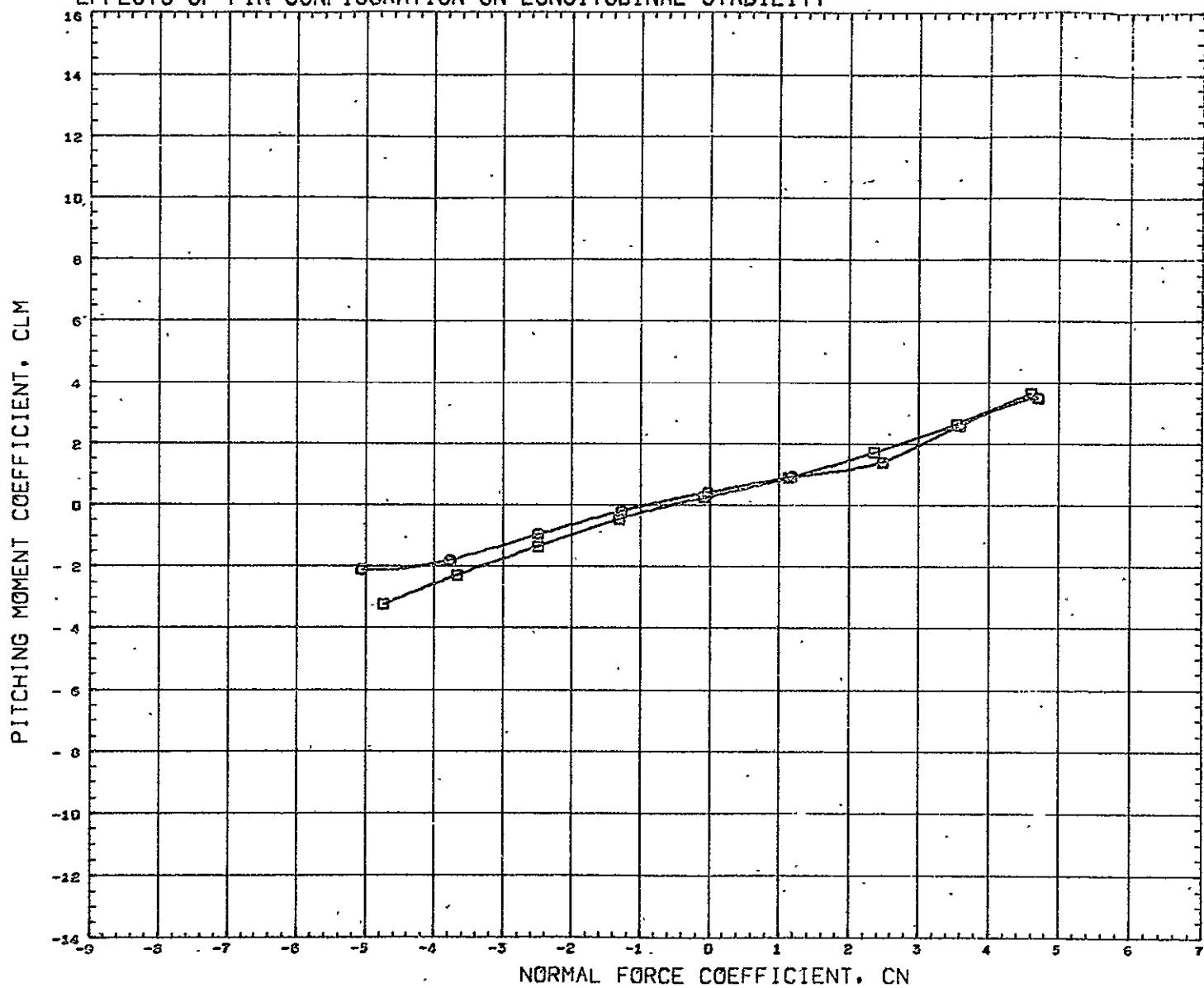
PARAMETRIC VALUES

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
KRPF	5.2640	INCHES
YRPF	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

NACH 1.198

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(R23021) O MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 BETA 0.020 ORBINC 1.000

(R25091) □ MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

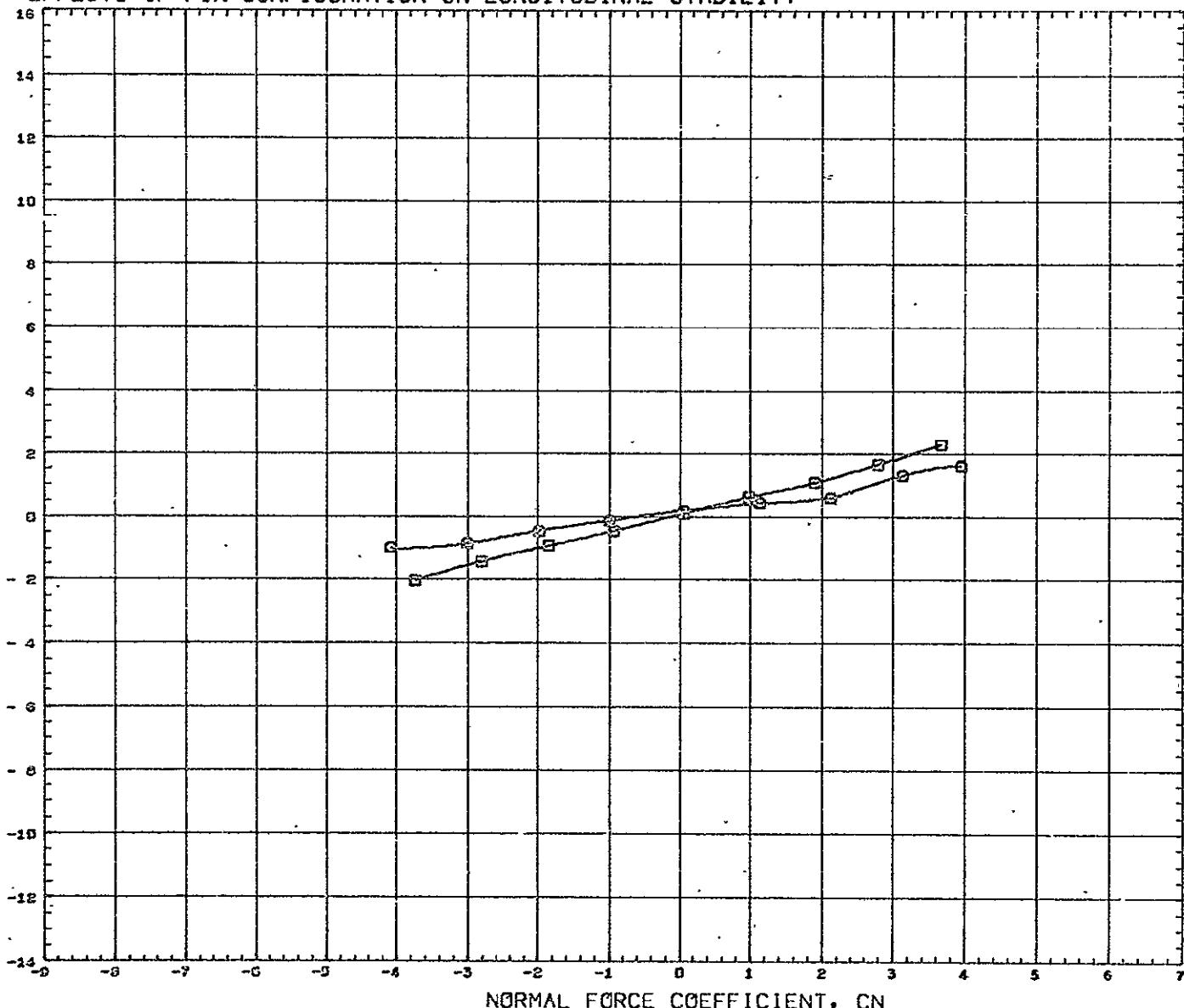
REFS	1.3960	SO. IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.465

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EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

PITCHING MOMENT COEFFICIENT, CLM



DATA SET SYMBOL CONFIGURATION DESCRIPTION
(R23021) O NSFC 47G NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17

(R25091) □ NSFC 47G NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

NORMAL FORCE COEFFICIENT, CN

PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3980	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.952